



San Joaquin Valley

AIR POLLUTION CONTROL DISTRICT



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DATE: June 20, 2019

TO: SJVUAPCD Governing Board

FROM: Samir Sheikh, Executive Director/APCO
Project Coordinator: Sheraz Gill

RE: **ITEM NUMBER 13: ADOPT PROPOSED
AMENDMENTS TO THE DISTRICT'S
RESIDENTIAL WOOD BURNING EMISSION
REDUCTION STRATEGY**

RECOMMENDATIONS:

1. Adopt proposed amendments to Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters).
2. Adopt proposed amendments to the District's *Burn Cleaner Program* to offer additional financial incentives to Valley residents for the replacement of existing high polluting wood burning devices with cleaner devices and authorize the Executive Director/APCO to make administrative changes to the program, as necessary.
3. Authorize the Chair to sign the attached Resolution.

BACKGROUND:

Given the significant localized health impacts associated with residential wood smoke, your Board has shown great leadership in addressing wood smoke emissions from residential fireplaces and wood burning devices. Today, the District has the toughest and most effective residential wood burning strategy in the nation. The District's Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters) in conjunction with the District's *Burn Cleaner* grant program have proven to be extremely effective in advancing the District's objectives to attain the PM2.5 federal standards and protect public health. This approach that combines regulatory and incentive based strategies is designed to improve public health by reducing toxic wood smoke emissions in Valley neighborhoods during the peak PM2.5 winter season (November through February).

On November 15, 2018, your Board adopted the District's *2018 PM2.5 Plan for the 1997, 2006, and 2012 PM2.5 Standards (2018 PM2.5 Plan)*, which includes a suite of innovative regulatory and incentive-based measures, supported by robust public education and outreach efforts to reduce emissions of PM2.5 in the Valley. One of the measures included in the plan is to amend District Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters) as a necessary cost-effective measure for further reducing PM2.5 emissions and bringing the Valley into attainment with federal PM2.5 standards within the mandated federal deadlines. As an early action towards implementation of the *2018 PM2.5 Plan*, your Board directed staff to immediately commence with the public process for the development of the enhanced residential wood burning strategy, including rulemaking for Rule 4901 and the necessary related enhancements to the District's *Burn Cleaner* incentive grants, public outreach and education, enforcement, and air quality forecasting programs.

Today's recommendations are based on a strong scientific foundation and would establish an even higher benchmark as the most stringent and effective residential wood burning emission reduction strategy in the nation. The proposed strategy was developed through an extensive public process and would begin to be implemented immediately, including implementation of the more stringent wood burning curtailments during the coming 2019-20 winter season.

DISCUSSION:

The San Joaquin Valley's challenges in meeting national ambient air quality standards are unmatched anywhere in the nation due to the region's unique geography, meteorology and topography. In response to the latest federal mandates and to improve quality of life for Valley residents, the District has developed and implemented multiple generations of rules on various sources of air pollution. Valley businesses are currently subject to the most stringent air quality regulations in the nation. Since 1992, the District has adopted nearly 650 rules to implement an aggressive on-going control strategy to reduce emissions in the Valley, resulting in air quality benefits throughout the Valley. Despite substantial progress made to improve air quality in the Valley through the implementation of existing plans and clean air investments by Valley businesses and residents, more reductions in emissions are needed to attain the ever toughening federal standards.

The *2018 PM2.5 Plan* contains a comprehensive set of local and state measures that build on existing measures to further reduce air pollution from stationary, area, and mobile sources throughout the Valley. Attaining the multiple federal PM2.5 standards by the mandated deadlines is not possible without significant additional reductions in wood smoke emissions. This measure has historically and will continue to provide for significant localized health benefits resulting from reduced residential wood burning emissions and exposure. Scientific studies show that prolonged inhalation of wood

smoke contributes to a variety of health impacts, including lung disease, pulmonary arterial hypertension, and pulmonary heart disease.

The District has utilized a multifaceted approach to reducing residential wood burning emissions in the Valley and has continually enhanced the strategy since adopting the first regulation in 1993. The District's comprehensive strategy includes implementation of stringent curtailment requirements through Rule 4901, strong outreach and education to establish the necessary public support and response, and deployment of financial incentives to transition away from wood burning to cleaner alternatives.

Additional Residential Wood Burning Reductions Critical for Attainment

Using the extensive body of knowledge regarding formation of PM_{2.5} in the Valley, and through the work conducted for the *2018 PM_{2.5} Plan*, both the District and CARB performed extensive modeling to project future PM_{2.5} concentrations throughout the Valley. This modeling was performed consistent with EPA guidance, and involved thousands of hours of sophisticated computer modeling and review by a team of technical staff, including close coordination between CARB and the District. In addition to the modeling conducted by CARB and the District, the District also performed extensive analysis that provides additional supporting evidence that indicates that attainment is not possible without the reductions in directly-emitted PM_{2.5} emissions from residential wood burning.

Health Impacts of Wood Smoke Particulate Matter Emissions

Reducing emissions from residential wood burning is a high priority for the District, as multiple scientific studies show that prolonged inhalation of wood smoke has adverse impacts on human health. Inhalation of wood smoke contributes to lung disease, pulmonary arterial hypertension, and pulmonary heart disease, which can eventually lead to heart failure. Wood smoke has also been linked to oxidative stress and blood coagulation and can ultimately lead to cancer. Children with the highest exposure to wood smoke show a significant decrease in lung function.

Health benefits from reducing emissions from residential wood burning are related to the high level of population exposure to urban residential wood burning emissions during the peak PM_{2.5} winter season. Residents can be exposed to wood smoke inside their homes when they use their wood burning devices. Additionally, residents can be exposed to wood smoke when neighbors use wood burning devices due to smoke infiltration into homes nearby. A Central Valley Health Policy Institute Study found that wood burning curtailments on high pollution days reduced annual exposure by 13.6% in Fresno, and an estimated 12.9% in Bakersfield resulting in 30 to 70 avoided cases of annual premature deaths.

Proposed Rule Amendments Informed by Scientific Public Survey

Given the significant public health benefits that can be realized cost-effectively from reductions in wood smoke emissions and to ensure continued effectiveness of the current strategy and explore potential enhancements, on June 15, 2017, your Board approved a contract with Gomez Research to conduct a bilingual scientific survey in late 2017 to assess residential wood burning behaviors in the Valley. Gomez Research surveyed over 1,500 Valley residents through an approach that consisted of both a general, random population of residents throughout the Valley as well as a supplemental sample, or "high-incidence area," of 500 residents living in targeted zip codes believed to have higher concentrations of wood burning devices. Overall, the large survey response by Valley residents provides statistically significant results that can be relied upon to enhance our understanding of residential wood burning behavior in the San Joaquin Valley. The survey results, as detailed below, support lowering the residential wood burning curtailment thresholds, coupled with enhanced public outreach and increased incentive amounts for the *Burn Cleaner Program*.

Scientific studies show that prolonged inhalation of wood smoke contributes to lung disease, pulmonary arterial hypertension, and pulmonary heart disease, which can eventually lead to heart failure. However, survey findings suggest that of Valley residents that engage in wood burning, only 36% are aware of the detrimental health impacts associated with wood smoke. It is reasonable to conclude that with enhanced public education, more Valley residents could be persuaded to refrain from wood burning. The survey findings also suggest that of Valley residents who have a wood burning device, the majority (by a 3 to 1 margin) are English speaking and most (by a greater than 2 to 1 margin) have above-median income. Therefore, the following actions are supported by the survey and included in the recommended strategy enhancements:

- Strong public education highlighting the effectiveness and low cost associated with residential wood burning curtailment regulations as compared to alternative regulations with great direct or indirect cost to Valley businesses and residents.
- Increase emphasis on health impacts of wood smoke through messaging within paid advertisements, educational videos, brochures and other outreach opportunities.
- Target a greater share of the outreach at the Valley's English-speaking population with above-median incomes.

Survey results indicate that the District has made significant gains in educating the public about the *Burn Cleaner Program* over the past few years. Twenty-four percent of the general population residents surveyed reported that they had heard of the *Burn Cleaner* incentives program, a statistically significant increase over the 17% reported in 2014. Furthermore, the number of Valley residents willing to switch to a cleaner device has increased from 29% in 2014 to 36%. Despite these improvements, smoke from residential wood burning is still a significant source of particulate matter in the Valley

during the winter. Increasing the turnover of old, polluting wood-burning devices is still a key component of the District's PM_{2.5} control strategy, so the District must continue to look for ways to increase program participation. More respondents were willing to purchase with at least a 75% incentive than they were initially without an incentive, indicating that increased, targeted incentives funding in this region would be more effective than targeting other regions. Therefore, the following actions are supported by the survey and included in the recommended strategy enhancements:

- Increase the incentive amount offered in the Valley's Hot Spot areas.
- Increase the use of clean wood burning units through continued regulatory incentives by offering residents who switch to clean burning units more days to use their devices.
- Continue to offer greater financial incentives for natural gas conversion.

With respect to Valley residents' compliance with the District's burn prohibitions, the survey results, although sample size is limited, are in line with the District's observations through extensive field enforcement activities that illustrate a high compliance rate. The overwhelming majority of the Valley residents (85%) believe that the current rule restrictions are either appropriate or too aggressive. As the District contemplates future changes to the rule, these survey results may indicate that continued high compliance rate might diminish resulting in a negative impact on air quality. However, attaining the latest federal standards is not possible without additional reductions from residential wood burning devices. As public acceptance is a key factor in achieving the desired compliance rate and resulting emission reductions, for the changes to be effective, incorporating all of the following components in the program is imperative:

- Meaningful financial incentives for upgrading to cleaner units.
- Maintaining regulatory incentives for Valley residents who switch to clean burning units.
- Increase emphasis on health impacts of wood smoke through messaging within paid advertisements, educational videos, brochures and other outreach opportunities.
- Strong public education highlighting the effectiveness and low cost associated with residential wood burning curtailment regulations as compared to alternative regulations with great direct or indirect cost to Valley businesses and residents.
- Continue strong enforcement.

PROPOSED ENHANCEMENTS TO RESIDENTIAL WOOD BURNING EMISSION REDUCTION STRATEGY:

The District has utilized a multifaceted approach to reducing residential wood burning emissions in the Valley that includes implementation of stringent curtailment requirements through Rule 4901, strong outreach and education to establish the necessary public support, and deployment of financial incentives to transition away from wood burning to cleaner alternatives. The following summarizes proposed enhancements to the District's strategy in each of these areas.

Summary of Proposed Amendments to Rule 4901

The *2018 PM_{2.5} Plan* includes commitments for enhanced Valleywide measures and targeted measures focused in specific Hot Spot areas of the Valley (Madera, Fresno, and Kern counties) that will achieve further emission reductions where they are needed most to protect public health and help the Valley attain federally mandated air quality standards. The proposed Valleywide amendments to Rule 4901 include new requirements for significant remodels of a fireplace or chimney that require the removal of open hearth fireplaces or replacement to cleaner devices, only allowing seasoned wood to be burned, enhanced compliance during transfers of residential real property, further restrictions on installations of new wood burning devices, and enhanced visible emission limitations.

Lower Curtailment Thresholds for Hot Spot Counties (Madera, Fresno, and Kern)

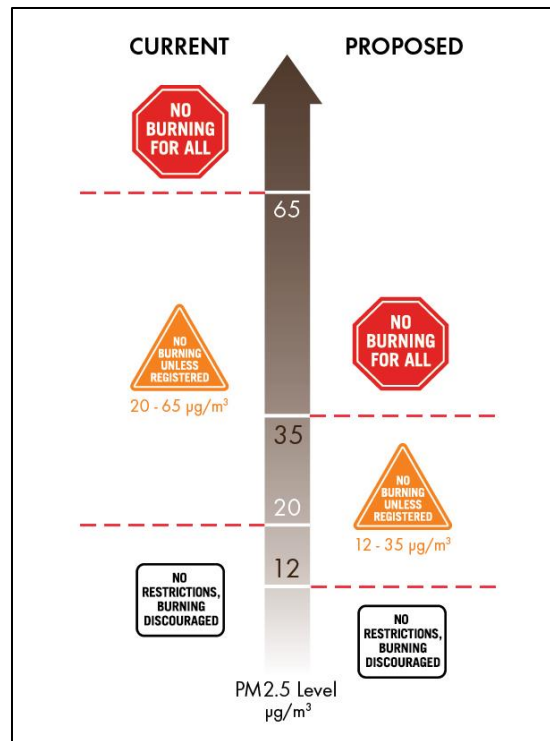
Despite significant reductions in population exposure to unhealthy pollution concentrations, under the federal Clean Air Act, the entire Valley is designated as not meeting a federal standard if only one monitor exceeds the standard. Extensive modeling for the *2018 PM_{2.5} Plan* concluded that after incorporating an exhaustive list of aggressive potential measures Valley wide, additional emissions reductions would still be required in the counties of Madera, Fresno, and Kern to reach attainment by the mandated deadlines. As a result, the *2018 PM_{2.5} Plan* includes commitments for more stringent wood burning curtailment levels in Hot Spot areas (Madera, Fresno, and Kern counties), that will achieve further emission reductions where they are needed most to protect public health and help the Valley attain federally mandated air quality standards.

The proposed amendments to Rule 4901 would establish more stringent curtailment levels in the Hot Spot counties of Madera, Fresno, and Kern as follows (see Figure 1 for graphical representation):

- Lower the "No Burning Unless Registered" threshold (Level One) from the current level of 20 µg/m³ to 12 µg/m³, and
- Lower the "No Burning for All" threshold (Level Two) from the current level of 65 µg/m³ to 35 µg/m³.

For all non-Hot Spot counties of the Valley, the District proposes to maintain the current curtailment thresholds.

**Figure 1 Current and Proposed Curtailment Thresholds in Hot Spots
(Counties of Madera, Fresno, and Kern)**



The following tables provide the potential number of wood burning prohibitions that may occur in each of the Hot Spot counties at the proposed curtailment thresholds. These estimates are based on observed PM2.5 concentrations over the last five winter seasons. Due to the proposed lower curtailment thresholds, there will be an increase in the number of curtailment days within these counties.

Table 1 Level One Curtailments in Hot Spot Counties (Proposed and Current)

County	Curtailment Days Proposed Threshold (≥ 12 and ≤ 35 $\mu\text{g}/\text{m}^3$)	Curtailment Days Current Threshold (≥ 20 and ≤ 65 $\mu\text{g}/\text{m}^3$)	Additional Curtailment Days
Fresno	71	57	14
Kern (SJV)	61	54	7
Madera	68	45	23

Table 2 Level Two Curtailments in Hot Spot Counties (Proposed and Current)

County	Proposed Threshold (> 35 $\mu\text{g}/\text{m}^3$)	Current Threshold (> 65 $\mu\text{g}/\text{m}^3$)	Additional Curtailment Days
Fresno	20	3	17
Kern (SJV)	22	4	18
Madera	12	1	11

To assist Valley residents to replace wood burning devices with cleaner natural gas units in these counties with more stringent curtailment thresholds, the District is proposing to offer enhanced incentives to fund the replacement of wood burning devices with clean burning gas devices as discussed further below.

In addition to the more stringent curtailment thresholds for the Hot Spot counties, the proposed amendments to Rule 4901 also include the following Valley-wide changes:

Applicability

Section 2.3 would be amended to extend the applicability of the rule to all real property sales and transfers.

Section 2.4 would be amended to remove “in a new residential development” to clarify that the rule applies to any person who installs a wood burning fireplace, regardless of whether it is for a new, existing, business or residential development.

Sale or Transfer of Residential Real Property

This section currently requires that during the sale or transfer of all real residential properties, the seller submit verification of compliance to the buyer and the District that wood burning heaters on the property are compliant or exempt at the time of heater purchase/install or such devices have been rendered permanently inoperable. This is currently only required for properties with wood burning heaters (all other homes currently exempt).

The District has found that there is considerable confusion amongst sellers and realtors on the submittal of this form due to the limited subset of transactions subject to the requirement, which has led to inconsistent submittals of the statement of compliance forms and compliance challenges. In order to provide consistency and ease to realtors and sellers, this amendment would require the submittal of the statement of compliance form for the sale or transfer of all residential properties.

Significant Remodels of Fireplace or Chimney

A new requirement would be added to only allow the installation of an EPA certified, gas-fueled, or electric device during a remodel of a fireplace or chimney that exceeds \$15,000 and requires a building permit where the application for the permit is submitted after January 1, 2020. A remodel is defined as a physical modification to a fireplace or chimney that impacts the physical structure of the fireplace or chimney. Aesthetic modifications that do not affect the physical structure of the fireplace are not considered a remodel, i.e. installing decorative stone/tile in front of fireplace.

Limiting Installations of New Wood Burning Devices

The current requirements regarding the installation of new devices (Section 5.4) would remain in effect until December 31, 2019 and are summarized below:

- If >2 dwellings/acre
 - No wood burning fireplaces (open hearth) may be installed

- No more than two certified wood burning heaters may be installed
- If ≤ 2 dwellings/acre
 - No more than one wood burning fireplace or certified wood burning heater per dwelling may be installed

Beginning on January 1, 2020, the following proposed restrictions on the installation of new wood burning devices would take effect.

- For areas below 3,000 feet elevation with natural gas service
 - No installation of wood burning fireplaces, low mass fireplace, masonry heater, or wood burning heaters
- For areas at or above 3,000 feet elevation or areas without natural gas service
 - No installation of more than two certified devices per acre (limited to one per dwelling unit)
 - No installation of wood burning fireplaces or non-certified wood burning heaters

Fuel Prohibitions

Proposed amendment to Section 5.6 would add non-seasoned wood to the list of fuel prohibitions.

Visible Emission Limitations

The current rule requires that under normal operating conditions, no person shall cause or allow any visible smoke from a registered wood burning heater. The proposed amendment to Section 5.8 of Rule 4901 would clarify this existing requirement and add a visible emission limit to wood burning fireplaces and non-registered wood burning heaters as follows:

- Under normal operating conditions, no person shall cause or allow any visible smoke from a registered wood burning heater.
- Under normal operating conditions, no person shall cause or allow from a wood burning fireplace or nonregistered wood burning heater a visible emission of any air contaminant, other than uncombined water vapor, that exceeds No.1 on the Ringelmann Chart or 20 percent opacity for a period or periods aggregating more than three (3) minutes in any one (1) hour.

The rule originally noticed on May 21, 2019, exempted limited periods of startup, adding fuel, and extinguishing the fire from the definition of normal operating conditions. Upon further evaluation, staff have determined that adding fuel and extinguishing the fire should not be excluded from the definition of "normal operating conditions," and therefore, consistent with the April 11, 2019, draft rule available for public comment, the limited exemption from visible emission requirements for these activities has been removed from the proposed final draft of the rule.

Test Methods

Section 7.3 of Rule 4901 would be modified to include Method 9 as a test method for the proposed visible emission limit.

Clarifications to Existing Rule Requirements

Proposed amendments will simplify rule language and clarify requirements through the removal of redundant and expired language in the rule and through new and revised definitions.

Contingency Provision

Consistent with the District's *2018 PM_{2.5} Plan*, this amendment would add a contingency provision. This would require that on and after sixty days following the effective date of EPA final rulemaking that the San Joaquin Valley Air Basin has failed to attain the 1997, 2006, or 2012 National Ambient Air Quality Standard by the applicable attainment date specified in the EPA-approved *2018 PM_{2.5} Plan* adopted by the District Governing Board on November 15, 2018, the PM_{2.5} curtailment levels for any county that has failed to attain the applicable standard shall be lowered to the curtailment levels in place for Hot Spot counties (5.7.1.2 and 5.7.2.2) as follows:

- Lower the "No Burning Unless Registered" threshold (Level One) from the current level of 20 µg/m³ to 12 µg/m³, and
- Lower the "No Burning for All" threshold (Level Two) from the current level of 65 µg/m³ to 35 µg/m³.

Summary of Proposed Amendments to Burn Cleaner Incentive Program

The District's strategy to reach attainment of the federal PM_{2.5} standards relies heavily on incentive programs to achieve cost-effective emission reductions of direct PM_{2.5} and PM_{2.5} precursors. Given the enormity of emissions reductions necessary to bring the Valley into attainment of the 1997, 2006, and 2012 federal PM_{2.5} standards, the Valley cannot reach attainment through regulatory measures alone, and significant additional emissions reductions through incentive-based measures are necessary.

The District's Burn Cleaner Wood Stove Change-out Program (*Burn Cleaner Program*) plays a key role in the success of the transition from older more polluting wood burning heaters and fireplaces to cleaner wood burning heaters. Since 2006, the *Burn Cleaner Program* has been helping residents overcome some of the financial obstacles in purchasing cleaner alternatives. The District works with its program partners and is also actively engaged with the community and hearth industry to encourage participation in the program, particularly among low-income Valley residents.

Results from the scientific survey discussed above also identified potential opportunities, including increasing outreach effectiveness through more communication regarding the health impacts associated with wood burning emissions and increasing interest in transitioning to cleaner devices through financial and regulatory incentives.

The District continues to take proactive steps to enhance the *Burn Cleaner Program* and as such, proposes the following changes to the District's current *Burn Cleaner Program* as a complementary strategy to the proposed regulatory amendments.

Hot Spot Incentive Amounts (Madera, Fresno, and Kern Counties)

To support the implementation of the new enhanced curtailment thresholds in Hot Spot counties and to maximize the effectiveness of limited available resources, the District proposes to increase incentive grants in areas subject to the new more stringent curtailment levels to encourage participation and achieve the needed transition to cleaner devices and associated emissions reductions. The District proposes to amend the *Burn Cleaner Program* as follows based on program results to date and findings from the 2017 scientific public survey (all incentive options require replacement of eligible wood burning devices):

1. Offer increased maximum funding level of \$3,000 for the purchase of a natural gas-fired unit (includes \$500 for installation) to all applicants residing in areas of Hot Spot counties with access to natural gas.
2. Offer new incentive option for the purchase and installation of electric heat pumps as follows at a maximum funding level of:
 - a. \$4,000 per unit to all applicants residing in areas in Hot Spot counties with access to natural gas
 - b. \$1,500 per unit to applicants residing in areas of Hot Spot counties without access to natural gas (additional \$1,500 for low-income applicants)
 - c. \$1,500 per unit to applicants residing in Valley counties outside of Hot Spot areas (additional \$1,500 for low-income applicants)
3. Limit incentive options in areas of Hot Spot counties with access to natural gas to only fund the purchase and installation of natural gas and electric devices, and maintain current incentive levels for applicants residing outside of Hot Spot counties and in areas of Hot Spot counties without access to natural gas.

**Table 3 Proposed Incentives for Hot Spot Counties
(Madera, Fresno, Kern)**

Location	Incentive Level
Areas with Access to Natural Gas	Up to \$3,000 for natural gas unit (\$2,500 for unit + \$500 for install) Up to \$4,000 for electric heat pump unit Available to all applicants regardless of income level
Areas without Access to Natural Gas	Up to \$1,000 for eligible certified or pellet wood devices Up to \$1,500 for propane unit (\$1,000 for unit + \$500 for install) Up to \$1,500 for electric heat pump unit Additional \$1,500 for qualified low-income applicants

**Table 4 Proposed Incentives for Other Valley Counties
(San Joaquin, Stanislaus, Merced, Kings, Tulare)**

Incentive Level
Up to \$1,000 for eligible certified or pellet wood devices Up to \$1,500 for natural gas/propane unit (\$1,000 for unit + \$500 for install) Up to \$1,500 for electric heat pump unit Additional \$1,500 for qualified low-income applicants

Emission Reductions from Proposed Amendments to District Wood Burning Reduction Strategy

The proposed strategy is estimated to achieve 0.42 tons per day of directly-emitted PM2.5, based on an annual daily average. This includes potential emissions reductions that would be achieved from the proposed amendments to Rule 4901 and the transition from higher polluting wood burning devices to cleaner units through the *Burn Cleaner Program*.

Enhanced Public Outreach and Education Campaign

The success of implementing the proposed amendments to the residential wood burning program will hinge on the expansion of the District's comprehensive multi-lingual residential wood burning outreach and education program. The District has an extremely successful outreach and education program with regards to residential wood burning and educating Valley residents about air quality, the effects of air pollution on the population's health, and on options residents can take to reduce emissions.

In the District's latest public opinion survey conducted in 2017, 85% of residents in the Fresno and Bakersfield metropolitan areas indicated they were familiar with *Check Before You Burn*, the District's public education effort most recognized by Valley residents. Elsewhere in the Valley, 63% of residents know about the program.

The District's seasonal public outreach advertising campaign is retooled each year to include timely and relevant messaging. In the past few seasons, this messaging has been delivered by the District's Governing Board members, with strategically placed outdoor billboards in English and Spanish, targeted radio and TV spots, and value-added messaging delivered through media throughout the Valley.

The key message of this outreach is to ask residents to assess their county's wood burning curtailment status by calling the District's 1-800 number, checking the *Check Before You Burn* website, Valley Air app, or local news outlets, and visiting social media. The District maintains partnerships with television, newspaper, radio, print media and outdoor advertising, as well as non-traditional media, such as on-screen messaging in local movie theaters, internet advertising and video loops in medical offices.

As the District moves forward with enhancements to the residential wood burning strategy, it is essential that the public outreach and education campaign be designed to support the new strategy and its intended outcomes. Utilizing the results from the 2017 scientific survey, the public outreach and education campaign will focus on:

- Strong public education highlighting the effectiveness and low cost associated with residential wood burning curtailment regulations as compared to alternative regulations with great direct or indirect cost to Valley businesses and residents.
- Increase emphasis on health impacts of wood smoke through messaging within paid advertisements, educational videos, brochures and other outreach opportunities.
- Leveraging our partnerships with Healthy Air Living Schools to conduct education regarding the importance of reducing wood smoke emissions.
- Expanding partnerships with cities, counties, health providers, and other local organizations to conduct education regarding the importance of reducing wood smoke emissions, including through increased participation in health fairs, public events, and presentations.
- Targeting a greater share of the outreach at the Valley's English-speaking population with above-median incomes.
- Encouraging residents to upgrade to cleaner certified devices and take advantage of the enhanced *Burn Cleaner Program*.

The District is prepared to work with retail partners, media partners, schools, and non-profit organizations to launch these new outreach and education efforts immediately after the adoption of proposed amendments.

Enhanced Enforcement

To optimize rule effectiveness and reduce the public health impact of wood smoke, the District dedicates extensive staffing resources to operate a robust Rule 4901

enforcement program covering all aspects of the rule. The District's strategy focuses on both compliance assistance and enforcement activities.

On all curtailment days, the District dedicates significant staffing resources to conducting surveillance in neighborhoods and responding to complaints from members of the public to ensure compliance with the rule. The District treats fireplace surveillance and complaint response as the highest priority enforcement activity. On each curtailment day, a substantial number of the District's inspection staff are assigned to perform surveillance with a focus on areas where non-compliance with the rule has been historically high and/or where public complaints regarding burning have been common. Notwithstanding this focus, the District works to ensure that surveillance is conducted regularly in all areas subject to regulatory curtailments. In addition to the surveillance and complaint response conducted during normal business hours, the District also conducts surveillance and complaint response on weekends, holidays, and during nighttime hours.

Due to the vast geographic area covered by the District, the public plays a vital role in ensuring compliance with the curtailment requirements of Rule 4901. Even with strong public awareness and the high compliance rate discussed above, the District regularly receives complaints regarding residential wood burning and responds to each of the complaints in a timely manner.

To aid in the active and effective enforcement of Rule 4901, the District leverages technologies such as global positioning systems (GPS) and low-light imaging cameras. Each District enforcement vehicle is equipped with GPS, which gives a precise location in real-time of all vehicles using a web-based tool. Using GPS, the District can ensure optimal assignment of complaints to minimize response times and can track/manage routes for surveillance activities. The District utilizes low-light imaging technology designed to work with a single-lens reflex camera to facilitate enforcement of the Rule during nighttime hours. Cameras utilizing this technology can visualize and document visible smoke in low- to no-light conditions. The District prides itself on using the latest in technology to enhance its already robust enforcement of the Rule requirements.

When violations of the Rule 4901 curtailment provisions are documented, a Notice of Violation is issued which carries a \$100 penalty for first-time violations. Residents cited under the rule may either pay the \$100 penalty or pay \$50 and attend the District's residential wood burning "Smoke School". Smoke school focuses on the challenges and goals of the District as well as providing additional education about the Rule 4901 requirements and how to ensure compliance moving forward. The majority of the violations are first-time offenses. For residents who incur repeat violations of the rule, the monetary penalties issued by the District are significantly escalated to deter future non-compliance.

To effectively enforce the provisions of the Rule and to better respond to public complaints received at night and on weekend curtailment days, the District assigns staff hours for weekend and nighttime surveillance during the winter season.

In addition to the enforcement of the wood burning curtailments, the District provides outreach and education to real estate companies and associations regarding the disclosure requirements in the Rule and the requirement to remove from service any non-EPA certified wood burning devices at the time of property transfer. This includes presentations at association gatherings and one-on-one trainings as well as providing easy to understand pamphlets explaining the requirements and how to ensure compliance. Once submitted, the District reviews the required disclosures and takes appropriate enforcement action as necessary to ensure compliance with the Rule. In addition, the District works with city and county building departments to ensure that new residential developments are complying with the requirements to limit the number of wood burning devices.

The District is proposing further enhancements to this already robust and multifaceted enforcement strategy to ensure continued compliance with residential wood burning requirements, especially with the proposed more stringent wood burning curtailment thresholds. These additional enhancements include:

- Enhanced staffing resources dedicated to surveillance,
- Enhanced focusing of enforcement resources based on various parameters, including areas of concern and Hot Spot counties,
- Use of improved low-light camera technology to enhance effectiveness of night-time enforcement, and
- The proposed enhancements to the visible emissions and transfer of residential real property requirements will enable more targeted enforcement.

Air Quality Forecasting

The District issues daily wood burning declarations during the months of November through February for the various forecast areas throughout the Valley. These declarations are issued based on a scientific modeling analysis of current and projected PM2.5 concentrations that also takes into account meteorological conditions and other factors that may impact the projected air quality. Based on this daily analysis, wood burning declarations are issued based on the forecasted PM2.5 concentrations for the following day, and a comparison of these forecasted concentrations against the curtailment thresholds established in Rule 4901.

Calling residential wood-burning curtailments at lower concentration levels minimizes direct PM2.5 emissions, thus lowering the rate of PM2.5 build-up during periods of atmospheric stagnation. In these efforts, the District continually assesses air quality and meteorological forecasting tools to ensure that the most accurate and effective tools are being used to establish the daily air quality forecast. Since the proposed

amendments to Rule 4901 include lowering the wood burning curtailment thresholds for Hot Spot counties, using the most accurate tools and models will become even more important as the proposed curtailment threshold of 12 $\mu\text{g}/\text{m}^3$ approaches background levels of PM_{2.5} in the Valley. Continuing to research and employ the best scientific air quality and meteorological models will be vital as the District's forecasting program is updated to focus on these proposed curtailment thresholds.

Public Process for Developing Proposed Amendments

The District conducted a robust public process for developing the proposed amendments to Rule 4901 and the *Check Before You Burn* program. The public has been actively participating and providing feedback and comments on potential amendments to Rule 4901 as follows.

2018 PM_{2.5} Plan Development

The District hosted ten public workshops and updates at public meetings such as the Governing Board meetings, Public Advisory Workgroup meetings, Citizen Advisory Committee meetings, and Environmental Justice Advisory Group meetings throughout the plan development process. Potential opportunities to reduce emissions were discussed at these meetings, including potential emission reductions opportunities from Rule 4901. Public comments specific to Rule 4901 were received throughout the plan development process and incorporated into the plan as appropriate.

Public Workshops and Meetings for Rule 4901

The District hosted a public scoping meeting on December 12, 2018 to discuss potential amendments to District Rule 4901. The District hosted a public workshop to present draft amendments and receive public comments on April 11, 2019, followed by a two-week comment period. Both of these meetings were held in the evening hours at all three District offices. Comments received were evaluated and incorporated into the rules and staff report as appropriate. Refer to the final draft staff report for a summary of significant comments and District responses. In addition to the workshops, the District provided regular updates on the development of Rule 4901 at public meetings of the District's Citizen's Advisory Committee and Environmental Justice Advisory Group.

Public Hearing for Rule 4901

In accordance with CH&SC section (§) 40725, the proposed amendments to Rule 4901 and summary description were publicly noticed and made available prior to the Governing Board public hearing to consider adoption of the proposed amendments. All significant comments received were considered and incorporated into the proposed rule and staff report, as appropriate. A summary of significant comments and District responses is available in the final draft staff report. The public is also invited to provide comments on the proposed amendments to Rule 4901 and staff report during the public hearing on June 20, 2019.

Public Comments and Responses

The comments and questions received during the public engagement process have been integral to the development of this rule. Overall, the District has received support in moving forward with the proposed enhancements during the public process, with most public feedback seeking clarification of the proposed enhancements. The District has responded to comments both verbally at public workshops and in writing (see final draft staff report) and has incorporated suggestions as appropriate in the proposed rule. Some key comments and questions raised during development of this rule are summarized below:

1. **COMMENT:** District should ensure that the proposed rule is as stringent as wood burning curtailment rules in other air districts.

RESPONSE: Proposed amendments to Rule 4901 as a whole are far more stringent than analogous rules in other air districts. Matching the curtailment threshold in other air districts' rules will not result in any reductions in emissions and in fact would result in an increase in emissions. As discussed above, the District is going far above any of the other districts and is proposing to lower the curtailment levels to 12 $\mu\text{g}/\text{m}^3$ and 35 $\mu\text{g}/\text{m}^3$ for Level One and Level Two curtailments, respectively, which are more stringent than the curtailment levels adopted by other districts and achieve significant additional emissions reductions. In addition to the stringent curtailment levels, the proposed amendments also include a number of other Valley-wide measures addressing visible emissions, transfers, prohibited fuels, and other related issues.

2. **COMMENT:** There are already strong regulations in place to disclose to homeowners rules regarding wood-burning stoves, and non-compliant appliances are already rendered inoperable or removed before most sales. Please consider that existing requirements already in place provide enough disclosures and protections for consumers and for the environment.

RESPONSE: Rule 4901 currently requires that during the sale or transfer of all real residential properties, the seller submit verification of compliance to the buyer and the District that wood burning heaters on the property are compliant or exempt at the time of heater purchase/install or such devices have been rendered permanently inoperable. This is currently only required for properties with wood burning heaters (all other homes currently exempt). Given the limited applicability of the current requirement and confusion amongst sellers, the District is proposing to simplify the process by requiring streamlined disclosure for all residential real property transfers, and work closely with realtors, title companies, and related trade associations to standardize the process and conduct the necessary outreach.

Supporting Regulatory Analyses

Economic Analysis

The District has prepared a cost effectiveness analysis to analyze the economic feasibility of the proposed rule amendments. No significant socioeconomic impacts are expected from this rule project. Refer to the final draft staff report for these analyses.

Rule Consistency Analysis

The District prepared a rule consistency analysis that compares the elements of the proposed amendments for Rule 4901 with the corresponding elements of other District rules and federal regulations and guidelines that apply to the same type of equipment or source category. The proposed amendments and proposed new rule will not conflict with other District rules, or federal rules, regulations, or policies covering analogous stationary sources. Refer to the final draft staff report for this analysis.

Environmental Impacts

The proposed amendments to District Rule 4901 would strengthen and enhance the current rule requirements in residential wood burning to achieve additional emissions reductions and meet the commitments made in the *2018 PM2.5 Plan*. As noted in the staff report, this project will not have any adverse significant impacts and is exempt from CEQA. Pursuant to Section 15062 of the CEQA Guidelines, the District will file a Notice of Exemption upon your Board approval of amendments to Rule 4901.

FISCAL IMPACT:

Sufficient funding is included in the District's 2019-20 Recommended Budget to accommodate the additional staffing, incentive grants, and related resources required to implement the proposed strategy and no Budget amendments are recommended at this time.

Attachments:

Attachment A: Resolution for Proposed Amendments to Rule 4901 (4 pages)

Attachment B: Proposed Amendments to Rule 4901 (18 pages)

Attachment C: Final Draft Staff Report with Appendices for Proposed Amendments to Residential Wood Burning Emission Reduction Strategy (67 pages)

San Joaquin Valley Unified Air Pollution Control District
Meeting of the Governing Board
June 20, 2019

**ADOPT PROPOSED AMENDMENTS TO THE DISTRICT'S RESIDENTIAL
WOOD BURNING EMISSION REDUCTION STRATEGY**

Attachment A:

Resolution for Proposed Amendments to Rule 4901
(4 PAGES)

BEFORE THE GOVERNING BOARD OF THE
SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL DISTRICT

IN THE MATTER OF: PROPOSED } RESOLUTION NO. _____
AMENDMENTS TO RULE 4901 (WOOD }
BURNING FIREPLACES AND WOOD }
BURNING HEATERS) }

WHEREAS, the San Joaquin Valley Unified Air Pollution Control District (District) is a
duly constituted unified air pollution control district, as provided in California Health and
Safety Code (CH&SC) Sections (§) 40150 et seq. and 40600 et seq.; and

WHEREAS, said District is authorized by CH&SC §40702 to make and enforce all
necessary and proper orders, rules, and regulations to accomplish the purpose of
Division 26 of the CH&SC; and

WHEREAS, pursuant to federal Clean Air Act (CAA) §107, the San Joaquin Valley Air
Basin (Valley) is designated as nonattainment for the national health-based air quality
standards for particulate matter 2.5 microns and smaller (PM2.5); and

WHEREAS, the District Governing Board adopted 2018 Plan for the 1997, 2006, and
2012 PM2.5 Standards (*2018 PM2.5 Plan*) on November 15, 2018 pursuant to the
federal Clean Air Act; and

WHEREAS, the District's *2018 PM2.5 Plan* commits the District to amend Rule 4901 to
further reduce directly emitted PM2.5 emissions from this source category; and

WHEREAS, a public hearing for the adoption of proposed amendments to Rule 4901
was duly noticed for June 20, 2019, in accordance with CH&SC §40725.

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS:

1. The Governing Board hereby adopts the proposed amendments to Rule 4901
(Wood Burning Fireplaces and Wood Burning Heaters). Said rule shall become effective
on June 20, 2019.

2. The Governing Board hereby finds, based on the evidence and information
presented at the hearing upon which its decision is based, that all notices required to be

given by law have been duly given in accordance with CH&SC §40725, and the
Governing Board has allowed public testimony in accordance with CH&SC §40726.

3. In connection with said rulemaking, the Governing Board makes the following
findings as required by CH&SC §40727:

a. **NECESSITY.** The Governing Board finds, based on the staff report, public
testimony, and the record for this rulemaking proceeding, that a need exists for said rule
amendments. Adopting said rule is necessary to meet the commitments of the SIP and
requirements of the federal CAA and the California CAA. Said rule satisfy the
commitment in the District's *2018 PM2.5 Plan*.

b. **AUTHORITY.** The Governing Board finds that it has the legal authority for
said rulemaking under CH&SC §40000 and 40001.

c. **CLARITY.** The Governing Board finds that said rule is written or displayed
so that the meaning can be easily understood by those persons or industries directly
affected by said rule.

d. **CONSISTENCY.** The Governing Board finds that said rule is in harmony with,
and not in conflict with or contradictory to, existing statutes, court decisions, or state or
federal regulations.

e. **NONDUPLICATION.** The Governing Board finds that said rule does not
impose the same requirements as any existing state or federal regulation.

f. **REFERENCE.** The Governing Board finds that said rulemaking implements
federal CAA §172(c)(1) and CH&SC §40920.

4. The Governing Board hereby finds that the requirements of CH&SC §40728.5
and 40920.6 have been satisfied to the greatest extent possible, and that the Governing
Board has actively considered and made a good faith effort to minimize any adverse
socioeconomic impacts associated with the proposed rulemaking.

5. The Governing Board finds that, because this rulemaking will not cause either a
direct physical change in the environment or a reasonably foreseeable indirect physical

1 change in the environment, the proposed actions do not constitute a project under the
2 provisions of the California Environmental Quality Act (CEQA) Guidelines §15378.
3 Furthermore, the proposed actions are exempt for actions taken by regulatory agencies,
4 as authorized by state or local ordinance, to assure the maintenance, restoration,
5 enhancement, or protection of the environment where the regulatory process involves
6 procedures for protection of the environment (CEQA Guidelines §15308) (Actions by
7 Regulatory Agencies for Protection of the Environment) and exempt from CEQA per the
8 general rule that CEQA applies only to projects which have the potential for causing a
9 significant effect on the environment (CEQA Guidelines §15061 (b)(3)).

10 6. Pursuant to Section 15062 of the CEQA guidelines, the Executive Director/Air
11 Pollution Control Officer is directed to file a Notice of Exemption with the County Clerks
12 of each of the counties in the District.

13 7. The Executive Director/Air Pollution Control Officer is directed to file with all
14 appropriate agencies certified copies of this resolution and the rule adopted herein and
15 is directed to maintain a record of this rulemaking proceeding in accordance with
16 CH&SC §40728.

17 8. The Executive Director/Air Pollution Control Officer is directed to transmit said rule
18 to the California Air Resources Board for incorporation into the SIP.

19 9. The Governing Board authorizes the Executive Director/Air Pollution Control
20 Officer to include in the submittal or subsequent documentation any technical
21 corrections, clarifications, or additions that may be needed to secure EPA approval,
22 provided such changes do not alter the substantive requirements of the approved rule.

23 ///

24 ///

25 ///

26 ///

27 ///

1 **THE FOREGOING** was passed and adopted by the following vote of the
2 Governing Board of the San Joaquin Valley Unified Air Pollution Control District this 20th
3 day of June 2019, to wit:

4
5 **AYES:**
6

7
8 **NOES:**
9

10
11 **ABSENT:**
12

13
14
15 SAN JOAQUIN VALLEY UNIFIED
16 AIR POLLUTION CONTROL DISTRICT

17 By _____
18 Buddy Mendes, Chair
19 Governing Board

20 **ATTEST:**
21 Deputy Clerk of the Governing Board

22 By _____
23 Michelle Franco
24

San Joaquin Valley Unified Air Pollution Control District
Meeting of the Governing Board
June 20, 2019

**ADOPT PROPOSED AMENDMENTS TO THE DISTRICT'S RESIDENTIAL
WOOD BURNING EMISSION REDUCTION STRATEGY**

Attachment B:

Proposed Amendments to Rule 4901
(18 PAGES)

RULE 4901 WOOD BURNING FIREPLACES AND WOOD BURNING HEATERS (Adopted July 15, 1993; Amended July 17, 2003; Amended October 16, 2008; Amended September 18, 2014; Amended [rule adoption date])

1.0 Purpose

The purpose of this rule is to limit emissions of carbon monoxide and particulate matter from wood burning fireplaces, wood burning heaters, and outdoor wood burning devices.

2.0 Applicability

This rule applies to:

- 2.1 Any person who manufactures, sells, offers for sale, or operates a wood burning fireplace, wood burning heater, or outdoor wood burning device.
- 2.2 Any person who sells, offers for sale, or supplies wood intended for burning in a wood burning fireplace or wood burning heater.
- 2.3 Any person who sells or transfers ~~or receives a wood burning heater as part of a real property sale or transfer.~~
- 2.4 Any person who installs a wood burning fireplace or wood burning heater ~~in a new residential development.~~

3.0 Definitions

- 3.1 APCO: the Air Pollution Control Officer of the San Joaquin Valley Unified Air Pollution Control District.
- 3.2 ASTM: the American Society for Testing and Materials.
- 3.3 Consumer: any person other than a distributor or a retailer who buys a wood burning fireplace, wood burning heater, or outdoor wood burning device.
- 3.4 Distributor: any person other than a manufacturer or a retailer who sells, offers for sale, or supplies wood burning fireplaces, wood burning heaters, or outdoor wood burning devices to retailers or others for resale.
- 3.5 EPA: the United States Environmental Protection Agency.

- 3.6 EPA Certified: any wood burning heater that meets the standards set forth in Title 40 Code of Federal Regulations (CFR), Part 60, Subpart AAA and labeled pursuant to those regulations ~~Meets the performance and emissions standards set forth in the NSPS.~~
- 3.7 Garbage: any solid, semisolid, and liquid wastes generated from residential, commercial, and industrial sources, including trash, refuse, rubbish, industrial wastes, asphaltic products, manure, vegetable or animal solid or semisolid wastes, and other discarded solid or semisolid wastes.
- 3.8 Low Mass Fireplace: any fireplace and attached chimney, as identified in ASTM E 2558-7, "Determining Particulate Matter Emissions from Fires in Low Mass Wood-burning Fireplaces," that can be weighed (including the weight of the test fuel) on a platform scale.
- 3.9 Manufacturer: any person who constructs or imports a wood burning fireplace or wood burning heater.
- 3.10 Masonry Heater: any site-built or site-assembled, wood burning heating device constructed mainly of masonry materials in which the heat from intermittent fires burned rapidly in its firebox is stored in its structural mass for slow release to the site. Such wood burning heating devices must meet all federal requirements and be designed and constructed per specifications set forth in ASTM E 1602-3, "Guide for Construction of Solid Fuel Burning Masonry Heaters."
- ~~3.11 New Residential Development: any single or multi-family housing unit, for which construction began on or after January 1, 2004. Construction began when the foundation for the structure was constructed.~~
- 3.112 New Wood Burning Heater: any wood burning heater that has not been sold, supplied, or exchanged for the first time by the manufacturer, the manufacturer's distributor or agency, or a retailer.
- 3.123 Normal Operating Conditions: the operation of a wood burning fireplace or wood burning heater as defined in this rule, except when a fire is started in the wood burning heater, when fuel is added to the wood burning heater, and when the fire is being extinguished. Visible smoke produced during these three events fire startup shall not exceed fifteen minutes per event. Startup of a new fire shall not exceed 15 consecutive minutes in any consecutive four-hour period.
- 3.134 NSPS: New Source Performance Standard. For purposes of this rule the NSPS is the Code of Federal Regulations, Part 60, Title 40, Subpart AAA.

- 3.145 Outdoor Wood Burning Device: any wood burning fireplace, or other device designed to burn wood, and that is located outside of a building or structure. This includes, but is not limited to, burn bowls, fire rings/pits, and chimineas. This does not include fire pits at state parks, national parks, or national forests.
- 3.156 Paints: any exterior and interior house and trim paints, enamels, varnishes, lacquers, stains, primers, sealers, undercoaters, roof coatings, wood preservatives, shellacs, and other paints or paint-like products.
- 3.167 Paint Solvents: any organic solvents sold or used to thin paints or clean up painting equipment.
- 3.178 Pellet-Fueled Wood Burning Heater: any wood burning heater manufactured for the purpose of heating a space and is intended to operate on pellet fuel.
- 3.189 Pellet Fuel: includes, but is not limited to, compressed sawdust, compressed paper products, and compressed forest residue, wood chips and other waste biomass, ground nut-hulls and fruit pits, corn, and cotton seed.
- 3.1920 Permanently Inoperable: modified in such a way that a wood burning heater can no longer operate as a wood burning heater.
- 3.204 PM: particulate matter. PM2.5 has an aerodynamic diameter equal to or less than 2.5 microns. PM10 has an aerodynamic diameter equal to or less than 10 microns.
- 3.212 Real Property: the land itself and anything that is permanently affixed to the land, such as buildings, and structures. ~~Examples of real property include heating and air conditioning systems, water lines, or electrical systems that primarily are used to control the environment for people and to benefit the land.~~
- 3.22 Remodel: a physical modification to a fireplace or chimney that impacts the physical structure of the fireplace or chimney. Aesthetic modifications that do not affect the physical structure of the fireplace are not considered a remodel, i.e. installing decorative stone/tile in front of fireplace.
- 3.23 Retailer: any person engaged in the sale of wood burning fireplaces, wood burning heaters, or outdoor wood burning devices directly to the consumer.
- 3.24 Seasoned Wood: wood of any species that has been sufficiently dried so as to contain 20 percent or less moisture by weight.
- 3.25 Treated Wood: wood of any species that has been chemically impregnated, painted, or similarly modified to improve resistance to insects or weathering.

- 3.26 Used Wood Burning Heater: any wood burning heater that has been used at least once, except wood burning heaters that have been used by retailers for the purpose of demonstration.
- 3.27 Waste Petroleum Product: any petroleum product other than gaseous fuels that has been refined from crude oil, and has been used, and, as a result of use, has been contaminated with physical or chemical impurities.
- 3.28 Wood Burning Fireplace: any permanently installed masonry or factory built wood burning device designed to be used with an air-to-fuel ratio greater than or equal to 35-to-1.
- 3.29 Wood Burning Heater: an enclosed, wood burning appliance capable of and intended for space heating (i.e. wood stove, pellet-fueled wood burning heater, or wood burning fireplace insert).
- 3.30 Wood Burning Season: for purposes of this rule, the months of November, December, January, and February.

4.0 Exemptions

The following devices are exempt from the provisions of this rule:

- 4.1 Devices that are exclusively gaseous-fueled.
- 4.2 Cookstoves, as described in Code of Federal Regulations 60.531.
- 4.3 Any burning occurring on the ground is open burning and is subject to requirements of District Rule 4103.

5.0 Requirements

5.1 Sale or Transfer of Wood Burning Heaters

5.1.1 New wood burning heaters

No person shall advertise, sell, offer for sale, supply, install, or transfer a new wood burning heater unless it is either:

- 5.1.1.1 ~~EPA certified with a Phase II Certification or a more stringent certification as currently enforced in the NSPS at the time of sale or transfer,~~ EPA certified under the NSPS at time of

purchase or installation and at least as stringent as EPA Phase II requirements,

- 5.1.1.2 A pellet-fueled wood burning heater that is exempt from EPA certification pursuant to requirements in the NSPS, until such time that amendments to the NSPS are finalized to remove exemptions for pellet-fueled wood burning heaters, then all new wood burning heaters must comply with Section 5.1.1.1.

5.1.2 Used wood burning heaters

No person shall advertise, sell, offer for sale, supply, install, or transfer a used wood burning heater unless it has been rendered permanently inoperable, satisfies requirements pursuant to Section 5.1.1, or is a low mass fireplace, masonry heater, or other wood-burning device of a make and model that meets all federal requirements and has been approved in writing by the APCO.

5.1.3 Public Awareness Information

Retailers selling or offering for sale new wood burning heaters shall supply public awareness information with each sale of a wood burning heater in the form of pamphlets, brochures, or fact sheets on the following topics listed in Sections 5.1.3.1 through 5.1.3.6. Public awareness information shall be subject to the review and approval of the APCO.

- 5.1.3.1 Proper installation, operation, and maintenance of the wood burning heater,
- 5.1.3.2 Proper fuel selection and use,
- 5.1.3.3 Health effects from wood smoke,
- 5.1.3.4 Weatherization methods for the home,
- 5.1.3.5 Proper sizing of wood burning heaters, and
- 5.1.3.6 Episodic Wood Burning Curtailment levels as defined in Section 5.67.

- 5.1.4 Sections 5.1.1 and 5.1.2 do not apply to wood burning heaters subject to Section 5.2.

5.2 Sale or Transfer of Real Property

5.2.1 Effective until December 31, 2019

5.2.1.1 No person shall sell or transfer any real property which contains a wood burning heater without first assuring that each wood burning heater included in the real property is:

5.2.1.1.1 EPA Phase II Certified or has a more stringent certification under the NSPS at time of purchase or installation, or

5.2.1.1.2 A pellet-fueled wood burning heater that was exempt from EPA Certification pursuant to requirements in the NSPS at the time of purchase or installation, or

5.2.1.1.3 Rendered permanently inoperable

5.2.1.2 Upon the sale or transfer of real property, the seller shall provide to the recipient of the real property, and to the APCO, documentation of compliance with Section 5.2.1.1. Documentation shall be in the form of a statement signed by the seller describing the type(s) of wood burning heater(s) included in the real property transaction, and any action taken to comply with Section 5.2.1.1. The APCO shall make blank forms available to the public for the purpose of fulfilling this requirement.

5.2.2 Effective on or after January 1, 2020

5.2.2.1 No person shall sell or transfer any real property which contains a wood burning heater without first assuring that each wood burning heater included in the real property:

5.2.2.2.1 Meets certification under the NSPS at time of purchase or installation and is at least as stringent as EPA Phase II requirements,

5.2.2.2.2 Is a pellet-fueled wood burning heater that was exempt from EPA certification pursuant to requirements in the NSPS at the time of purchase or installation, or

5.2.2.2.3 Is rendered permanently inoperable and removed from property

5.2.2.2 Upon the sale or transfer of any residential real property in the San Joaquin Valley, the seller shall provide to the buyer of the real property and to the APCO, documentation certifying the following:

5.2.2.2.1 The type(s) and number(s) of wood burning heaters and wood burning fireplaces included in the real property transaction. If no wood burning heaters or wood burning fireplaces are included in the real property transaction, this should be documented.

5.2.2.2.2 Any action(s) taken to comply with Section 5.2.2.1.

5.2.2.2.3 Documents required by Section 5.2.2.2 shall be retained by the seller and shall again be made available to the APCO upon request.

5.3 Remodel of Wood Burning Fireplace or Chimney Where Total Cost Exceeds \$15,000, Local Building Permit is Required, and Application for Building Permit is Submitted On or After January 1, 2020

5.3.1 A person may only install a gas-fueled, electric, exempt, or EPA certified wood burning heater that meets requirements of NSPS at the time of installation.

5.43 Limitations on Wood Burning Fireplaces or Wood Burning Heaters in New Residential Developments

5.4.1 Effective until December 31, 2019

For any single or multi-family housing unit, for which construction began on or after January 1, 2004. Construction began when the foundation for the structure was constructed.

5.4.1.1 No person shall install a wood burning fireplace in a residential development with a density greater than two (2) dwelling units per acre.

5.4.1.2 No person shall install more than two (2) EPA Phase II Certified or more stringent certification as currently enforced under NSPS, wood burning heaters per acre in any residential development with a density greater than two (2) dwelling units per acre.

5.4.1.3 No person shall install more than one (1) wood burning fireplace or EPA Phase II Certified or more stringent certification, as currently enforced under the NSPS, per dwelling unit in any residential development with a density equal to or less than two (2) dwelling units per acre.

5.4.2 Effective on or after January 1, 2020

Requirements of Sections 5.4.2.1 and 5.4.2.2 do not apply to the retrofit or replacement of an existing wood burning fireplace, low mass fireplace, masonry heater, or wood burning heater to a cleaner device.

5.4.2.1 At elevations below 3,000 feet in areas with natural gas service, no person shall install a wood burning fireplace, low mass fireplace, masonry heater, or wood burning heater.

5.4.2.2 At elevations at or above 3,000 feet or in areas without natural gas service, no more than two (2) EPA certified wood burning heaters, that meet NSPS at time of installation, shall be installed per acre.

5.4.2.2.1 No person shall install more than one (1) EPA certified wood burning heater, that meets NSPS at time of installation, per dwelling unit.

5.4.2.2.2 No person shall install a wood burning fireplace, low mass fireplace, masonry heater, or non-certified wood burning heater.

~~5.3.1~~ ~~Effective until December 31, 2014~~

~~5.3.1.1~~ ~~No person shall install a wood burning fireplace in a new residential development with a density greater than two (2) dwelling units per acre.~~

~~5.3.1.2~~ ~~No person shall install more than two (2) EPA Phase II Certified wood burning heaters per acre in any new residential development with a density equal to or greater than three (3) dwelling units per acre.~~

~~5.3.1.3~~ ~~No person shall install more than one (1) wood burning fireplace or wood burning heater per dwelling unit in any new residential development with a density equal to or less than two (2) dwelling units per acre.~~

~~5.3.2~~ ~~Effective on and after January 1, 2015~~

~~5.3.2.1~~ ~~No person shall install a wood burning fireplace in a residential development with a density greater than two (2) dwelling units per acre.~~

~~5.3.2.2~~ ~~No person shall install more than two (2) EPA Phase II Certified or more stringent certification as currently enforced under NSPS, wood burning heaters per acre in any residential development with a density greater than two (2) dwelling units per acre.~~

~~5.3.2.3~~ ~~No person shall install more than one (1) wood burning fireplace or EPA Phase II Certified or more stringent certification, as currently enforced under the NSPS, per dwelling unit in any residential development with a density equal to or less than two (2) dwelling units per acre.~~

5.54 Advertising Requirements for Sale of Wood

5.54.1 No person shall sell, offer for sale, or supply any wood which is orally or in writing, advertised, described, or in any way represented to be “seasoned wood” unless the wood has a moisture content of 20 percent or less by weight.

5.54.2 The APCO may delegate to another person or agency the authority to test wood for moisture content and determine compliance with Section 5.54.1.

5.65 Prohibited Fuel Types

No person shall cause or allow any of the following materials to be burned in a wood burning fireplace, wood burning heater, or outdoor wood burning device:

5.65.1 Garbage,

5.65.2 Treated wood,

5.6.3 Non-seasoned wood,

5.6.45.3 Plastic products,

5.6.55.4 Rubber products,

5.6.65.5 Waste petroleum products,

~~5.6.75-6~~ Paints and paint solvents,

~~5.6.85-7~~ Coal, or

~~5.6.95-8~~ Any other material not intended by a manufacturer for use as fuel in a wood burning fireplace, wood burning heater, or outdoor wood burning device.

5.76 Episodic Wood Burning Curtailment

This section shall be in effect annually during the months of November through February.

5.76.1 Level One Episodic Wood Burning Curtailment

A wood burning fireplace, low mass fireplace, masonry heater, outdoor wood burning device, or nonregistered wood burning heater shall not be operated within the geographic region for which a Level One Episodic Wood Burning Curtailment is in effect.

5.76.1.1 For the counties of San Joaquin, Stanislaus, Merced, Kings, and Tulare, ~~t~~The APCO shall declare a Level One Episodic Wood Burning Curtailment for a geographic region whenever the potential for a PM_{2.5} concentration is forecast to equal or exceed 20 $\mu\text{g}/\text{m}^3$ but not exceed 65 $\mu\text{g}/\text{m}^3$ for the geographic region.

5.7.1.2 For the counties of Madera, Fresno, and Kern, the APCO shall declare a Level One Episodic Wood Burning Curtailment for a geographic region whenever the potential for a PM_{2.5} concentration is forecast to equal or exceed 12 $\mu\text{g}/\text{m}^3$ but not exceed 35 $\mu\text{g}/\text{m}^3$ for the geographic region.

~~5.6.1.1~~ ~~A wood burning fireplace, low mass fireplace, masonry heater, outdoor wood burning device, or nonregistered wood burning heater shall not be operated within the geographic region for which a Level One Episodic Wood Burning Curtailment is in effect.~~

~~5.76.1.32~~ A wood burning heater that has an approved and current registration with the District may be operated within the geographic region for which a Level One Episodic Wood

Burning Curtailment is in effect provided the wood burning heater:

5.76.1.32.1 Is not fired on a prohibited fuel type pursuant to Section 5.65,

5.76.1.32.2 Is maintained according to manufacturer instructions, and

5.76.1.32.3 Is operated according to manufacturer instructions, ~~and~~

~~5.6.1.2.4 Has no visible smoke when operated under normal operating conditions.~~

5.76.2 Level Two Episodic Wood Burning Curtailment

A wood burning fireplace, low mass fireplace, masonry heater, outdoor wood burning device, or wood burning heater shall not be operated within the geographic region for which a Level Two Episodic Wood Burning Curtailment is in effect.

5.7.2.1 For the counties of San Joaquin, Stanislaus, Merced, Kings, and Tulare, ~~t~~The APCO shall declare a Level Two Episodic Wood Burning Curtailment for a geographic region whenever the potential for a PM2.5 concentration of greater than is forecast to exceed 65 $\mu\text{g}/\text{m}^3$ or for a PM10 concentration is forecast to equal or exceed of 135 $\mu\text{g}/\text{m}^3$ or greater is predicted for the geographic region. No person within the geographic region for which a Level Two Episodic Wood Burning Curtailment has been declared shall operate a wood burning fireplace, low mass fireplace, masonry heater, wood burning heater, or outdoor wood burning device when a Level Two Episodic Wood Burning Curtailment is in effect.

5.7.2.2 For the counties of Madera, Fresno, and Kern, the APCO shall declare a Level Two Episodic Wood Burning Curtailment for a geographic region whenever the potential for a PM2.5 concentration is forecast to exceed 35 $\mu\text{g}/\text{m}^3$ or a PM10 concentration is forecast to equal or exceed 135 $\mu\text{g}/\text{m}^3$ for the geographic region.

5.7.3 Contingency Provision

Notwithstanding Sections 5.7.1 and 5.7.2, on and after sixty days following the effective date of EPA final rulemaking that the San Joaquin Valley Air Basin has failed to attain the 1997, 2006, or 2012 National Ambient Air Quality Standard by the applicable attainment date specified in the EPA-approved 2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards adopted by the District Governing Board on November 15, 2018, the District shall notify the public of an Episodic Curtailment for the PM2.5 curtailment levels described in Sections 5.7.1.2 and 5.7.2.2 for any county that has failed to attain the applicable standard.

~~5.7.46.3~~ The following wood burning fireplaces and wood burning heaters are not subject to the provisions of Section ~~5.76.1~~ and ~~5.76.2~~:

~~5.7.4.16.3.1~~ Those in locations where natural gas service is not available. For the purposes of this rule, propane and butane are not considered natural gas, or

~~5.7.4.26.3.2~~ Those for whom a wood burning fireplace or wood burning heater is the sole available source of heat in a residence. This includes times of temporary service outages, as determined by the gas or electrical utility service.

~~5.7.56.4~~ Episodic Wood Burning Curtailment Notice

The APCO shall notify the public of each Episodic Wood Burning Curtailment by any of the following methods:

~~5.7.5.16.4.1~~ Provide notice to newspapers of general circulation within the San Joaquin Valley.

~~5.7.5.26.4.2~~ Broadcast of messages presented by radio or television stations operating in the San Joaquin Valley.

~~5.7.5.36.4.3~~ A recorded telephone message for which the telephone number is published.

~~5.7.5.46.4.4~~ Messages posted on the District's website, www.valleyair.org.

~~5.7.5.56.4.5~~ Any other method as the APCO determines is appropriate.

5.8 Visible Emissions Limitations

5.8.1 Under normal operating conditions, no person shall cause or allow any visible smoke from a registered wood burning heater.

5.8.2 Under normal operating conditions, no person shall cause or allow from a wood burning fireplace or nonregistered wood burning heater a visible emission of any air contaminant, other than uncombined water vapor, that exceeds No. 1 on the Ringelmann Chart or 20 percent opacity for a period or periods aggregating more than 3 minutes in any one (1) hour.

5.97 Registration of Wood Burning Heaters

5.97.1 Eligibility for Registration

A wood burning heater is eligible to be registered with the District provided it is either:

5.97.1.1 ~~EPA certified with a Phase II Certification or has a more stringent certification as currently enforced under the NSPS at the time of purchase or installation~~ Meeting certification under the NSPS at time of purchase or installation and is at least as stringent as EPA Phase II requirements, or

5.97.1.2 A pellet-fueled wood burning heater exempt from EPA certification requirements pursuant to requirements in the NSPS at the time of purchase or installation.

5.97.1.3 Wood burning heaters which do not meet the requirements of Section 5.97.1.1 or 5.97.1.2 are ineligible for registration.

5.97.1.4 Any registration of a wood burning heater which does not meet eligibility requirements is invalid.

5.7.2 ~~Interim Registration of Wood Burning Heaters~~

5.7.2.1 ~~For the wood burning season of 2014/2015 only, an Interim Registration program will be in place. A wood burning heater may participate in the Interim Registration program provided the wood burning heater:~~

5.7.2.1.1 ~~Meets the eligibility requirements pursuant to Section 5.7.1,~~

~~5.7.2.1.2 — Is registered in the Interim Registration program prior to use during Level One Episodic Wood Burning Curtailments, and~~

~~5.7.2.1.3 — Is operated in compliance with Section 5.5 and Section 5.6.~~

~~5.7.2.2 — Any interim registration of a wood burning heater which does not meet qualifications pursuant to Section 5.7.1 is invalid.~~

~~5.7.2.3 — Any interim registration of a wood burning heater may be disqualified pursuant to Section 5.9.~~

5.9.27.3 Registration Process

~~Effective during and after the 2015/2016 wood burning season, P~~persons applying to register a wood burning heater shall:

5.9.27.3.1 Submit a completed application and supplemental documentation demonstrating compliance with the eligibility requirements specified in Section 5.97.1 to the District. Supplemental documentation shall include the following:

5.9.27.3.1.1 Receipt or invoice from the installation or purchase that includes the manufacturer and model name of the wood burning heater, or

5.9.27.3.1.2 A certification from a District Registered Wood Burning Heater Professional verifying that the wood burning heater meets eligibility requirements pursuant to Section 5.97.1.

5.9.27.3.1.3 If the wood burning heater was purchased and/or installed more than one year prior to registration with the District, the person must show proof of inspection of the wood burning heater from a District Registered Wood Burning Heater Professional.

5.9.27.3.2 Pay a registration fee as required by Section 3.0 of District Rule 3901 (Fees for Registration of Wood Burning Heaters).

5.9.27.3.3 Operate the wood burning heater in compliance with the requirements in Section 5.65 and Section 5.76.

5.108 Renewal of Registration

- 5.108.1 Registration shall be valid for a period of up to three wood burning seasons from the date of registration issuance, unless the holder of the certificate is disqualified pursuant to Section 5.119.
- 5.108.2 Registration may be renewed by complying with the following requirements:
 - 5.108-2.1 Complete and submit to the District a Registration Renewal application with verification that the wood burning heater has been inspected by District Registered Wood Burning Heater Professional to verify that it is maintained pursuant to manufacturer specifications.
 - 5.108-2.2 Payment of a registration renewal fee as required by Section 4.0 of District Rule 3901.
- 5.10-8-3 Failure to comply with Sections 5.108.1 or 5.108.2 may result in disqualification of registration.

5.119 Disqualification of Registration

- 5.119.1 If the District finds a registered wood burning heater is operated in violation of the requirements of this rule, the registration may be disqualified, provided that notice and an opportunity for an office conference was afforded pursuant to Section 5.119.4.
- 5.119.2 A registration disqualified pursuant to Section 5.119.1 may be reinstated if subsequent to the disqualification the operator of the wood burning heater demonstrates compliance with the requirements of Section 5.65 and Section 5.76.
- 5.119.3 Persons with a disqualified registration pursuant to Section 5.119.1 may appeal the determination by petitioning to the APCO.
- 5.119.4 Notice of Preliminary Disqualification Determination

If the District makes a preliminary determination that a registered unit is in violation of Section 5.0, the following actions shall be taken:

- 5.119.4.1 Notify the person who registered the wood burning heater, in writing, that the District has made a preliminary

disqualification determination and pursuant to Section 5.119.1 the District may cancel the registration 30 calendar days after the date on the notice. The notice shall include all of the relevant facts relating to the preliminary determination that are known to the District at the time of the notice.

5.119.4.2 Request as part of the notification required by Section 5.119.4.1 that the person who registered the wood burning heater confer with the District, in an office conference within 30 calendar days of the date on the notice to discuss the facts relating to the preliminary disqualification determination.

5.119.4.3 Conduct the office conference required by Section 5.119.4.2 provided that the person who registered the wood burning heater accepts the request for the office conference.

5.119.5 Setting Aside a Disqualification

A disqualification determination pursuant to Section 5.119.1 shall be set aside by the APCO if the petitioner demonstrates to the satisfaction of the APCO that the violations forming the basis for the disqualification were the result of circumstances beyond the reasonable control of the petitioner and could not have been prevented by the exercise of reasonable care.

5.120 Registration of Wood Burning Heater Professionals

5.120.1 To qualify to register as a Wood Burning Heater Professional with the District the applicant must meet one of the following criteria; this must be active, valid, and current:

5.120.1.1 Fireplace Investigation Research and Education (F.I.R.E.) Certified Inspector, or

5.120.1.2 Chimney Safety Institute of America (CSIA) certification, or

5.120.1.3 National Fireplace Institute (NFI) certification, or

5.120.1.4 A person determined to be qualified to perform inspections, maintenance, and cleaning activities on wood burning heaters by the APCO.

5.120.2 Persons applying to register as a Wood Burning Heater Professional with the District shall:

5.120.2.1 Submit a completed application for registration to the District.

5.120.2.2 Submit any necessary supplemental documents as determined by the APCO as necessary to verify statements and qualifications as presented in the application for registration.

5.120.2.3 If the applicant does not have a certification pursuant to Sections 5.120.1.1 through 5.120.1.3 the applicant may submit an application to the APCO with supplemental documentation verifying that the applicant meets the certification standards as required by certifications pursuant to Sections 5.120.1.1 through 5.120.1.3.

5.120.3 Registration as a Wood Burning Heater Professional with the District is valid for up to three years from the date of issuance.

5.120.4 The District shall maintain a list of registered Wood Burning Heater Professionals on the District web page.

5.131 Inspection of Registered Wood Burning Heaters

The District has the right of entry for the purpose of inspecting any wood burning heater registered with the District in order to enforce or administer this rule.

6.0 Administrative Requirements

6.1 Upon request of the APCO, the manufacturer shall demonstrate that each wood burning heater subject to the requirements of Sections 5.1 or 5.2 is compliant with said requirements.

6.2 The person who registers the wood burning heater shall retain a copy of the District issued registration and make it available upon request.

7.0 Test Methods

7.1 Moisture content of wood shall be determined by the current version of ASTM Test Method D 4442.

7.2 Compliance with visible-smoke free operation of the wood burning heater pursuant to Section 5.76 shall be determined using EPA Method 22 (Visible Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares).

- 7.3 Compliance with the visible emission limit pursuant to Section 5.8 shall be determined using US EPA Method 9 for visual determination of the opacity of emissions.

San Joaquin Valley Unified Air Pollution Control District
Meeting of the Governing Board
June 20, 2019

**ADOPT PROPOSED AMENDMENTS TO THE DISTRICT'S RESIDENTIAL
WOOD BURNING EMISSION REDUCTION STRATEGY**

Attachment C:

**Final Draft Staff Report with Appendices for
Proposed Amendments to District's Residential Wood Burning
Emission Reduction Strategy**
(67 PAGES)

FINAL DRAFT STAFF REPORT

Amendments to District's Residential Wood Burning Emission Reduction Strategy

June 20, 2019

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I. SUMMARY

The U.S. Environmental Protection Agency (EPA) periodically reviews and establishes health-based air quality standards for ozone, particulates, and other pollutants. Although the San Joaquin Valley's (Valley) air quality is steadily improving, the Valley experiences unique and significant difficulties in achieving these increasingly stringent standards. The Valley's challenges in meeting national ambient air quality standards are unmatched in the nation due to the region's unique geography, meteorology and topography. In response to the latest federal mandates and to improve quality of life for Valley residents, the District has developed and implemented multiple generations of rules on various sources of air pollution. Valley businesses are currently subject to the most stringent air quality regulations in the nation. Since 1992, the District has adopted nearly 650 rules to implement an aggressive on-going control strategy to reduce emissions in the Valley, resulting in air quality benefits throughout the Valley. Similarly, the California Air Resources Board (CARB) has adopted stringent regulations for mobile sources. Together, these efforts represent the nation's toughest air pollution emissions controls and have greatly contributed to reduced ozone and particulate matter concentrations in the Valley.

Due to the significant investments made by Valley businesses and residents and stringent regulatory programs established by the District and CARB, the Valley's ozone and PM_{2.5} (particulate matter that is 2.5 microns or less in diameter) precursor emissions are at historically low levels, and air quality over the past few years has continued to set new clean air records. Despite the significant progress under these regulations, greatly aided by the efforts of Valley businesses and residents, many air quality challenges remain, including attainment of the federal air quality standards for PM_{2.5} that are addressed in the District's recently adopted *2018 Plan for the 1997, 2006, and 2012 PM_{2.5} Standards (2018 PM_{2.5} Plan)*.

The *2018 PM_{2.5} Plan* contains a comprehensive set of local and state measures that build on existing measures to further reduce air pollution from stationary, area, and mobile sources throughout the Valley. Attaining the multiple federal PM_{2.5} standards by the mandated deadlines is not possible without significant additional reductions in wood smoke emissions. The District's residential wood burning emissions reduction strategy has historically and will continue to provide for significant localized health benefits resulting from reduced residential wood burning emissions and exposure. Scientific studies show that prolonged inhalation of wood smoke contributes to a variety of health impacts, including lung disease, pulmonary arterial hypertension, and pulmonary heart disease.

Given the significant localized health impacts associated with residential wood smoke, today, the District has the toughest and most effective residential wood burning strategy in the nation. The District's Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters) in conjunction with the District's *Burn Cleaner* grant program have proven to be extremely effective in advancing the District's objectives to attain the PM_{2.5} federal

standards and protect public health. This approach that combines regulatory and incentive based strategies is designed to improve public health by reducing toxic wood smoke emissions in Valley neighborhoods during the peak PM_{2.5} winter season (November through February).

The *2018 PM_{2.5} Plan* includes a suite of innovative regulatory and incentive-based measures, supported by robust public education and outreach efforts to reduce emissions of PM_{2.5} in the Valley. One of the measures included in the plan is to amend District Rule 4901 as a necessary cost-effective measure for further reducing PM_{2.5} emissions and bringing the Valley into attainment with federal PM_{2.5} standards within the mandated federal deadlines. As an early action towards implementation of the *2018 PM_{2.5} Plan*, the District's Governing Board directed staff to immediately commence with the public process for the development of the enhanced residential wood burning strategy, including rulemaking for Rule 4901 and the necessary related enhancements to the District's *Burn Cleaner* incentive grants, public outreach and education, enforcement, and air quality forecasting programs.

The proposed amendments are based on a strong scientific foundation and would establish an even higher benchmark as the most stringent and effective residential wood burning emission reduction strategy in the nation. The proposed strategy was developed through an extensive public process and would begin to be implemented immediately, including implementation of the more stringent wood burning curtailments during the coming 2019-20 winter season.

II. IMPORTANCE OF REDUCING RESIDENTIAL WOOD BURNING EMISSIONS

The District has utilized a multifaceted and proactive approach to reducing residential wood burning emissions in the Valley and has continually enhanced the strategy since adopting the first regulation in 1993. The District's comprehensive strategy includes implementation of stringent curtailment requirements through Rule 4901, strong outreach and education to establish the necessary public support, and deployment of financial incentives to transition away from wood burning to cleaner alternatives. The proposed strategy is designed to improve public health by reducing toxic wood smoke emissions in Valley neighborhoods during the peak PM_{2.5} winter season (November through February).

The extreme air quality challenges of the Valley demand that the District and the community take extraordinary measures to improve air quality and public health. As a result, the District has developed the most stringent rules in the nation through the implementation of multiple generations of regulations. Valley businesses are currently subject to the most stringent air quality regulations in the nation. Despite significant progress in improving the Valley's air quality, more reductions in emissions are needed to attain the ever toughening federal standards. The District's attainment plans contain

a comprehensive set of local and state measures to reduce air pollution from stationary and mobile sources throughout the Valley. However, attaining the multiple federal PM2.5 standards by the mandated deadlines will not be possible without significant further reductions in wood smoke emissions.

A. PM2.5 ATTAINMENT

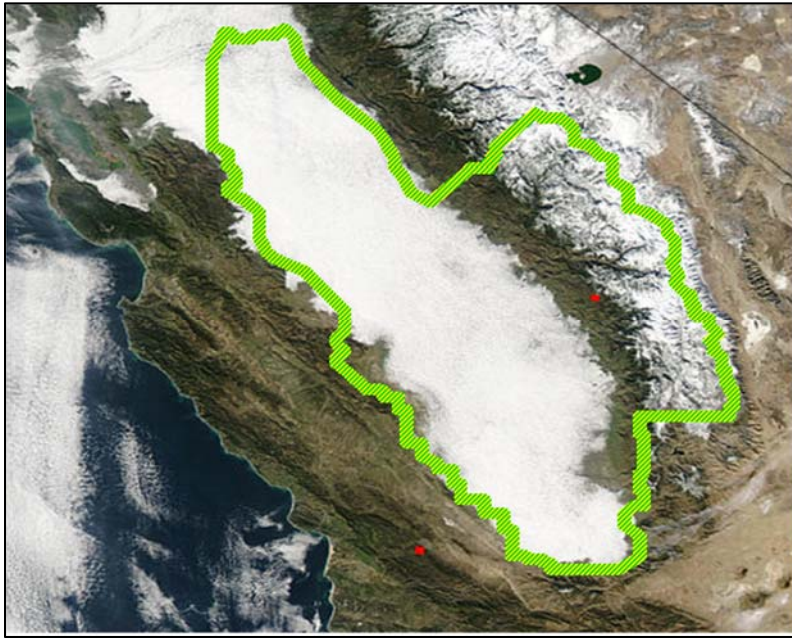
Using the extensive body of knowledge regarding formation of PM2.5 in the Valley, and through the work conducted for the *2018 PM2.5 Plan*, both the District and CARB performed extensive modeling to project future PM2.5 concentrations throughout the Valley. This modeling was performed consistent with EPA guidance, and involved thousands of hours of sophisticated computer modeling and review by a team of technical staff, including close coordination between CARB and the District. In addition to the modeling conducted by CARB and the District, the District also performed extensive analysis that provides additional supporting evidence that indicates that attainment is not possible without the reductions in directly-emitted PM2.5 emissions from residential wood burning.

Valley's Unique Air Quality Challenges

The Valley's geography, topography, and meteorology exacerbate the formation and retention of high levels of air pollution. The surrounding mountains trap pollution and block air flow, and the mild climate keeps pollutant-scouring winds at bay most of the year. Temperature inversions, while present to some degree throughout the year, can last for days during the winter, holding in nighttime accumulations of pollutants including wood smoke. It is during the winter that these days of stagnant weather lead to most of the exceedances of PM2.5 air quality standards in the Valley.

Due to these unique circumstances, no other region in the nation faces the enormous degree of difficulty that the Valley faces in meeting federal air quality standards for ozone and particulate matter. The Valley has far fewer pollutant emissions per square mile ("emission density") than other regions in California that have equivalent or even better air quality than the Valley. This is but one illustration of the unique challenges facing the Valley due to our geography and topography.

Figure 1 San Joaquin Valley Topography Traps Air Pollution



The Valley's natural challenge in reducing air pollution requires that the District and Valley businesses and residents take greater efforts to meet the challenging PM_{2.5} federal air quality standards and reduce significant amounts of wintertime emissions. The episodic and seasonal nature of high PM_{2.5} concentrations helps to narrow the focus of emissions reductions, but it also limits the number of months that strategies are most effective in reducing peak PM_{2.5} concentrations.

Residential Wood Burning Emissions

Wood smoke contains PM_{2.5} and an additional large number of ultrafine particles less than 0.1 microns (PM_{0.1}). Wood smoke also contains a number of gases including carbon monoxide, formaldehyde, sulfur dioxide, irritant gases, and known and suspected carcinogens, such as polycyclic aromatic hydrocarbons. People can be exposed to wood smoke when they or their neighbors use their wood burning heaters, wood burning fireplaces, or outdoor wood burning devices. Windows and doors cannot keep the particles in wood smoke out of homes. A CARB-funded study of residential wood smoke impacts on indoor air quality was conducted in Cambria, California and published in 2011.¹ Using aethalometers designed to monitor carbon black as the definitive chemical signature of wood smoke, the study found night-time outdoor concentrations in Cambria neighborhoods that were two to ten times higher than the cleanest part of the city. Most significantly, over the course of the winter season, indoor concentrations of black carbon in non-burning homes were found to be 74% as high as

¹ Thatcher, T. & Kirchstetter, T. (2011). Assessing Near-Field Exposures from Distributed Residential Wood Smoke Combustion Sources. Report prepared for the California Air Resources Board. Retrieved from <http://www.arb.ca.gov/research/rsc/10-28-11/item2dfr07-308.pdf>

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concentrations measured just outside the same homes. This combination of processes results in a very high intake fraction (the portion of the total emissions that actually end up being inhaled) from residential wood burning when compared to other sources of particulate matter that are less proximate. The following table is a summary of the winter average emissions in the Valley from the residential wood combustion source category as identified in the District's *2018 PM2.5 Plan*.²

Table 1 Winter Average Emissions (tpd) from Residential Wood Combustion

Pollutant	2019	2020	2022	2023	2024	2025
PM2.5	5.49	5.49	5.49	5.49	5.49	5.49
NOx	0.82	0.82	0.82	0.82	0.82	0.82

The emissions from residential wood combustion contribute to 9% of average winter PM2.5 emitted from stationary and area sources in the Valley's 2019 emission inventory, making residential wood burning one of the Valley's larger sources of directly-emitted PM2.5. Also, emissions associated with residential wood burning are confined to the time of year when the Valley more frequently experiences air quality with PM2.5 concentrations that exceed the PM2.5 federal air quality standards. These emissions occur during the evening time, when temperature inversions are more likely to occur, thus increasing the potential impacts on air quality and human health.

PM2.5 Plan Modeling

In developing the *2018 PM2.5 Plan*, the District and CARB took full advantage of the extensive scientific research and knowledge that has been developed to characterize the Valley's unique air quality chemistry and challenges. The California Regional Particulate Air Quality Study and the subsequent research built on its foundation, has shed light on the complexity of PM2.5 in the Valley. Using the extensive body of knowledge regarding formation of PM2.5 in the Valley, CARB performed extensive modeling to predict future PM2.5 concentrations throughout the Valley. This modeling was performed consistent with EPA guidance, and involved thousands of hours of sophisticated computer modeling and review by a team of technical staff, including close coordination with the District. In addition to the modeling by CARB, the District also performed extensive analysis that provides additional supporting evidence that the District's *2018 PM2.5 Plan* will effectively bring the Valley into attainment. Because of the effect of winter nighttime inversions, urban residential wood combustion has a disproportionate impact on daily and yearly PM2.5 concentrations in urban areas making emission reductions from residential wood burning a key contributor to bringing the entire Valley into attainment of the PM2.5 federal air quality standards.

² SJVUAPCD (2018). *2018 PM2.5 Plan*. Appendix C (Stationary Source Control Measure Analyses). Retrieved from <http://valleyair.org/pmplans/documents/2018/pm-plan-adopted/C.pdf>

B. HEALTH BENEFITS FROM REDUCING WOOD SMOKE EXPOSURE

Reducing emissions from residential wood burning is a high priority under the District's Health Risk Reduction Strategy, as multiple scientific studies show that prolonged inhalation of wood smoke has adverse impacts on human health. Health benefits from reducing emissions from residential wood burning are related to the high level of population exposure to urban residential wood burning emissions during the peak PM_{2.5} winter season. Based on a large body of interrelated scientific research conducted in the Valley and elsewhere, episodic curtailments of residential wood combustion under Rule 4901 have resulted in substantial health benefits for the Valley population. The large value of these benefits is related to (1) the high level of cumulative population exposure to urban residential wood combustion emissions compared to other sources, (2) the relative effectiveness of burning curtailments in reducing per capita PM_{2.5} exposure levels in urban areas where the Valley population is concentrated, (3) the relative toxicity of chemicals found in PM_{2.5} that are generated by wood combustion, and (4) the overnight penetration of PM_{2.5} into neighboring homes.

Polycyclic aromatic hydrocarbon species are recognized as potential carcinogens and are also highly implicated in the triggering of oxidative stress that promotes the malfunctioning of the immune system, particularly among previously sensitized individuals such as asthmatics.³ The toxic air pollutants in wood smoke can cause human health impacts such as coughs, headaches, and eye and throat irritation. Studies also show that prolonged inhalation of wood smoke contributes to chronic interstitial lung disease,⁴ pulmonary arterial hypertension,⁵ and pulmonary heart disease,⁶ which can eventually lead to heart failure in adults.⁷ Wood smoke has also been linked to detrimental mutagenic and systemic effects such as oxidative stress and blood coagulation, which can ultimately result in cell damage and possibly lead to cancer.^{8,9,10} Children with the highest exposure to wood smoke show a significant

³ Kelly, F.J. (2006) Oxidative Stress: Its Role in Air Pollution and Adverse Health Effects. *Occupational Environmental Medicine* 60:612–616. Retrieved from <http://oem.bmj.com/content/60/8/612.full>

⁴ Defined as a group of lung diseases affecting the interstitium resulting in a progressive scarring of lung tissue. The scarring associated with interstitial lung disease eventually affects the ability to breathe and get enough oxygen into the bloodstream.

⁵ Pulmonary arterial hypertension begins when tiny arteries in the lungs, called pulmonary arteries, and capillaries become narrowed, blocked, or destroyed. Making it harder for blood to flow to the lungs, and raises pressure within lung arteries.

⁶ Defined as an abnormal enlargement of the right side of the heart resulting from high blood pressure in the pulmonary blood vessels (aka pulmonary arterial hypertension).

⁷ Sandoval, J.; Slas, J.; Martinez-Guerra, M.L.; Gomez, A.; Martinez, C.; Portales, A.; Palomar, A.; Villegas, M.; and Barrios, R. Pulmonary Arterial Hypertension and Cor Pulmonale Associated with Chronic Domestic Woodsmoke Inhalation. (1993) *Chest* 103:12-20.

⁸ Danielsen, P.H.; Bräuner, E.V.; Barregard, L.; Sällsten, G.; Wallin, M.; Olinski, R.; Rozalski, R.; Møller, P.; Loft, S. Oxidatively damaged DNA & its repair after experimental exposure to wood smoke in healthy humans. (2008) *Mutat Res.* 642(1-2):37-42.

⁹ Barregard, L.; Allsten, G.S.; Gustafson, P.; Johansson, L.; Johannesson, S.; Basu, S.; Stigendal, L. Experimental Exposure to Wood-Smoke Particles in Healthy Humans: Effects on Markers of Inflammation, Coagulation, and Lipid Peroxidation (2006) *Inhalation Toxicology* 18:845–853.

¹⁰ Sapkota, A.; Gajalakshmi, V.; Jetly, D.H.; Roychowdhury, S.; Dikshit, R.P.; Brennan, P.; Hashibe, M.; Boffetta, P. Indoor air pollution from solid fuels and risk of hypopharyngeal/laryngeal and lung cancers: a multicentric case-control study from India. (2008) *Int J Epidemiol.* 37(2):321-8.

decrease in lung function.¹¹

On a regional level, the enclosed geophysical environment of the Valley acts to magnify the health impacts of wintertime residential wood combustion. The Valley regularly experiences multi-day periods of atmospheric stagnation during which very little air mass is transferred in and out of the Valley. The net result is a day-to-day buildup of PM2.5 levels. Compounding these multi-day stagnation events, the region experiences severe winter inversions upon nightfall, characterized by a marked reduction in the height of the mixing layer. This results in a magnified concentration of directly emitted particulates that envelop urban neighborhoods. Additionally, residents can be exposed to wood smoke when neighbors use wood burning devices due to smoke infiltration into homes nearby.

In 2008, the Central Valley Health Policy Institute found that District wood burning curtailments on high pollution days reduced annual exposure by 13.6% in daily PM2.5 exposure for Fresno, and an estimated 12.9% for Bakersfield¹² resulting in 30 to 70 avoided cases of annual premature mortality. The additional reductions in wood smoke resulting from the 2008 and 2014 amendments to Rule 4901 has resulted in a proportional increase in the health benefits of the rule. Additional proportional health benefits can be expected from further reducing wood smoke again.

III. UNDERSTANDING INFLUENCE OF METEOROLOGICAL CONDITIONS ON ELEVATED PM2.5

Weather plays a key role in atmospheric PM2.5 concentrations. Various meteorological conditions not only determine how fast PM2.5 particles are dispersed, it also controls how fast photochemistry converts precursor emissions into PM2.5 and controls whether or not certain gases are in a particulate (solid) phase or a gas phase. There are several key meteorological physical properties that influence PM2.5 concentrations.

A. WIND AND TEMPERATURE INSTABILITY PROVIDE THE STRONGEST MECHANISMS FOR POLLUTION DIFFUSION

A common misconception is that rainfall is what primarily disperses pollutants; however, horizontal and vertical mixing is required to disperse PM2.5 pollutants in the air. PM2.5 levels will not decrease on days when there is rainfall without significant wind. In order to disperse particulates in the atmosphere, wind flow (horizontal mixing) and/or temperature instability (decreasing temperature with height leading to vertical mixing) provide the strongest mechanisms for dispersing pollutants.

¹¹ Heumann, M.; Foster, L.R.; Johnson, L; Kelly, L. Woodsmoke Air Pollution and Changes in Pulmonary Function Among Elementary School Children (1991) Air & Waste Management Association 84th Annual Meeting & Exhibition, Vancouver, British Columbia.

¹² Lighthall, D., D. Nunes, and T. Tyner. Environmental Health Evaluation of Rule 4901: Domestic Wood Burning. Central Valley Health Policy Institute, California State University, Fresno. See www.cvhpi.org.

Atmospheric stability refers to the vertical mixing of the atmosphere. An inversion is defined as the temperature increasing with vertical height. Prolonged periods of high pressure and stable conditions with low wind speeds can cause stagnant conditions that trap pollutants near the earth's surface. PM_{2.5} concentrations increase during these poor dispersion periods. During low pressure events unstable conditions and stronger wind speeds occur. PM_{2.5} concentrations can decrease or increase depending on the strength and characteristics of the low pressure system.

Generally, the higher the wind speed the lower the PM_{2.5} concentrations. Winds mix pollutants and disperse them over a larger area, which generally improves air quality.

B. EFFECT OF HUMIDITY AND SUNLIGHT ON PM_{2.5} CONCENTRATIONS

Humidity and sunlight can lead to the creation of PM_{2.5} through photochemistry. In essence, particulate ammonium nitrate (NH₄NO₃) forms when the concentration product of gas-phase ammonia (NH₃) and nitric acid (HNO₃) exceeds a saturation point dependent on temperature, relative humidity, and the composition of the pre-existing particles that act as condensation substrate (Wexler and Seinfeld, 1991).¹³ The fraction of reactive nitrogen that forms nitric acid and/or nitrate depends on the concentration of NO_x and VOC as well as meteorological conditions such as temperature, relative humidity, and solar intensity.^{14, 15} When these conditions are prime, ammonium nitrate concentrations in the Valley can increase rapidly and significantly influence the overall concentration of PM_{2.5}. Due to this, reducing NO_x emissions across the Valley has long been a key strategy to reduce the ammonium nitrate portion of PM_{2.5}.

IV. CURRENT APPROACH TO REDUCE EMISSIONS

The District takes a multifaceted and proactive approach to reducing emissions from residential wood burning in the Valley and has continually enhanced the strategy since adopting the first regulation in 1993. Equally important to regulatory controls are the District's strong public outreach and education efforts which are aimed at giving the public a better understanding of why emissions from residential wood burning are so important and to empower them to know that they too can take actions to reduce emissions. Another component of the District's efforts includes deployment of financial incentives to transition away from wood burning to cleaner alternatives through incentive programs to assist with the cost impacts of replacing older more polluting wood burning heaters and wood burning fireplaces with cleaner alternatives. This measure has historically and will continue to provide for significant localized health benefits resulting from reduced residential wood burning emissions and exposure.

¹³ Wexler, A.S., Seinfeld, J.H. (1991). 2nd-Generation inorganic aerosol model. *Atmospheric Environment Part a-General Topics* 25 (12), 2731–2748.

¹⁴ Aw, J., Kleeman, M.J. (2003). Evaluating the First-Order Effect of Intra-Annual Temperature Variability on Urban Air Pollution. *Journal of Geophysical Research-Atmospheres* 108 (D12).

¹⁵ Nguyen, K. & Dabdub, D. (2002). NO_x and VOC Control and Its Effects on the Formation of Aerosols. *Aerosol Science and Technology* 36 (5), 560–572.

A. DISTRICT RULE 4901

Today, the District has the toughest and most effective residential wood burning strategy in the nation. The District's Rule 4901 in conjunction with the District's *Burn Cleaner* grant program have proven to be extremely effective in advancing the District's objectives to attain the PM_{2.5} federal standards and protect public health. This approach that combines regulatory and incentive based strategies is designed to improve public health by reducing toxic wood smoke emissions in Valley neighborhoods during the peak PM_{2.5} winter season (November through February). Rule 4901 is one of the District's most health protective rules, as it reduces emissions when and where most needed, such as during multi-day periods of stagnation and in the evening hours, and in neighborhoods where Valley residents live.

Rule 4901, which was first adopted in 1993 and subsequently amended three times, and has been essential to limiting wintertime directly emitted PM_{2.5} emissions in the Valley. The 1993 adoption of Rule 4901 established a public education program on techniques to reduce wood burning emissions. It also enforced EPA Phase II requirements for new wood burning heaters, prohibited the sale of used wood burning heaters, established a list of prohibited fuel types, and required the District to request voluntary curtailment of wood burning on days when the ambient air quality was unhealthy.

In 2003, the rule was amended and added episodic wood burning curtailments when air quality was forecast to be at 150 or higher on the air quality index (AQI), which was equivalent to a PM_{2.5} concentration of 65 µg/m³ at the time; added restrictions on the installation of wood burning devices in new residential developments, based on housing density; and added requirement that during the transfer of a residential property, sellers provide a statement of compliance to the District and buyer for residential real properties with non-compliant wood burning devices.

In 2008, the rule was amended and lowered the mandatory curtailment level to a PM_{2.5} concentration of 30 µg/m³, and added an attainment plan contingency measure that would lower the wood burning curtailment level to 20 µg/m³ if EPA were to find that the Valley did not attain the 1997 PM_{2.5} NAAQS in 2014.

In 2014, Rule 4901 was amended again and lowered the No Burn threshold for high polluting wood burning heaters and fireplaces from 30 µg/m³ to 20 µg/m³ and raised the No Burn threshold for cleaner certified wood burning devices to 65 µg/m³. The amendment doubled the number of No Burn days for high polluting units that were the source of over 95% of the wintertime residential wood smoke emissions.

B. BURN CLEANER INCENTIVE PROGRAM

The District's *Burn Cleaner Program* plays a key role in the success of the transition from older more polluting wood burning heaters and fireplaces to cleaner wood burning

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heaters. Through *Burn Cleaner*, the District offers financial incentives for the change-out of old, high-polluting open-hearth fireplaces or uncertified devices with new cleaner, certified units. The program has provided the resources necessary for thousands of Valley residents to make positive changes in their residential wood-burning practices and is a significant part of the District's overall strategy to reduce the impacts of residential wood burning. Given the potential high cost to replace older, high-polluting units, the program includes multiple levels of incentive funding, including a specific focus on low-income residents by providing higher incentives (up to \$3,000) and expanded eligibility criteria that make the purchase of a new, cleaner unit more economically feasible.

Since 2009, the District has issued over 16,600 vouchers with a total allocated funding amount of over \$24.2 million to date. Since inception of the program, 77% of funding provided has been for the cleanest option, natural gas devices, with the remaining funding provided for EPA-certified wood and pellet devices. Low-income residents make up over 17% of the vouchers with a total of over \$7.6 million in allocated funding. There are currently more than 30 hearth retailers in the Valley that have partnered with the District to successfully implement the *Burn Cleaner Program*.

Table 2 Multiple Levels of Incentive Funding for Burn Cleaner Program

NEW DEVICE TO BE PURCHASED	INCENTIVE AMOUNT
Certified wood insert/freestanding stove	Up to \$1,000
Certified pellet insert/freestanding stove	Up to \$1,000
Natural gas insert/freestanding stove	Up to \$1,000
Any eligible device if applicant is eligible for low-income	Up to \$2,500
Additional incentive towards gas device (for both Standard and Low-income)	Up to \$500*
*Applies only to eligible installation costs beyond the funding amount	

Ongoing Enhancements to the Burn Cleaner Program

The District continuously re-evaluates the *Burn Cleaner Program* and implements enhancements to the program. In addition to increased incentive amounts, the District has also implemented the following enhancements:

- Reducing a substantial portion of the upfront, out-of-pocket cost of a new qualifying unit for low-income qualified applicants. The District has partnered with contracted hearth retailers to allow low-income qualified applicants to make the purchase at a reduced price by deducting the incentive amount from the invoice at the point of purchase. Allowing the incentive funding to be directly applied at the time of purchase makes it more feasible for additional low-income applicants to take advantage of the program.
- Refining the low-income eligibility form to streamline the determination process and identifying the hearth retailers that provide the reduced upfront cost option.
- Program documents are available in Spanish to further extend the outreach efforts to the local community.
- Updates to program documents to make them more user-friendly and to improve the process during the application, installation, and claim for payment request phases.
- The document submittal process has been updated to allow applications to be completed online and claim for payment requests to be emailed to the District for faster processing. Also, supplemental forms have been developed further streamline the review process and help keep the retailers and applicants informed on the status of projects.

Low-income provisions

As part of the District's ongoing efforts to encourage more low-income qualified applicants to participate in the *Burn Cleaner Program*, significant enhancements were made to the low-income category of the *Burn Cleaner Program*. One of the key enhancements includes reducing a substantial portion of the upfront, out-of-pocket cost of a new qualifying unit. The District has partnered with contracted hearth retailers to allow low-income qualified applicants to make the purchase at a reduced price by deducting the incentive amount from the invoice at the point of purchase. Allowing the incentive funding to be directly applied when purchase is made makes it more feasible for additional low-income applicants to take advantage of the program.

Even though a higher incentive amount is provided to low-income applicants under the program, the District recognizes that the upfront cost of a new wood burning heater can still pose a financial challenge for many of those applicants and become a deterrent for them to participate in the program.

Additional enhancements include refining the low-income eligibility form to streamline the determination process and identifying the hearth retailers that provide the reduced upfront cost option.

Additional assistance for low-income residents

The District recognizes that a significant number of low-income residents in the San Joaquin Valley rent their homes (tenants) and expanded the program to provide low-income tenants an opportunity to reduce their emissions from residential wood burning through the *Burn Cleaner Program*. The tenants are directly affected by the emissions produced from using older, higher-polluting heaters, and any associated utility costs with the home. As a result, the District extended the low-income provisions to homeowners who rent to low-income qualified tenants, provided specific criteria are met through a careful District review and approval process.

The criteria included the following:

- Residential properties owned by local Public Housing Authorities are ineligible.
- Residential properties with eligible heaters must have existing tenants that either:
 - 1) Qualify under the Housing Choice Voucher Program (Section 8); or
 - 2) Meet the program's low-income eligibility requirements (verification required).
- Eligible low-income tenants must obtain written consent from residential property owners to participate in the program. Residential property owners can apply on behalf of eligible tenants.

Residential property owners must have valid signed lease/rental agreements with eligible low-income tenants with at least 6 months remaining on the lease.

Program documents in Spanish

Program documents are now available in Spanish to further extend the outreach efforts to the local community. While District staff are open and available to assist applicants with explaining how the program works and filling out the forms, the documents in Spanish are accessible for those who would like to review and complete the documents on their own.

Incentive program documents

Updates to program documents have made them more user-friendly and has further improved the process during the application, installation, and claim for payment request phases. Key enhancements include:

- Submittal of the pre-installation photo of the old wood burning heater or wood burning fireplace during the application phase to determine eligibility.
- The application now includes a section to provide the retailer's information and projected installation date as an option. This helps the District work with the applicant and retailer to ensure that everything done is within program guidelines.
- Heater-rated gas fireplaces have been identified in program documents as eligible for the Burn Cleaner program.

Document submittal process

Applications and claim for payment requests can now be emailed to the District for faster processing. Supplemental forms have been developed to further streamline the review process and help keep the retailers and applicants informed on the status of projects. The District recently launched an online portal for the *Burn Cleaner Program* that now provides the option for applicants to submit and check the status of their voucher for fireplace and woodstove change-outs, available at <https://www.valleyair.org/grants/apps/burncleaner/Home>.

Collaboration with participating hearth retailers

The District has renewed its contracts with the hearth retailers and hosted informational meetings to discuss program changes in order to ensure a smooth roll out of the enhancements. As part of the District's initiative to increase the effectiveness of the program, District staff has worked closely with the participating hearth retailers on outreach efforts and provided them with promotional tools, such as flyers and quick screens with information about the *Burn Cleaner Program*.

C. EXTENSIVE PUBLIC OUTREACH AND EDUCATION

The District operates a strong outreach and education program that informs Valley residents about air quality, the effects of air pollution on public health, and options they can take to reduce emissions from residential wood burning. The multilingual outreach and education program, known as *Check Before You Burn*, is well known in Valley communities and the process of checking before using a wood burning device is familiar to residents. The *Check Before You Burn* campaign messaging has assisted the public in understanding the residential wood burning program, its three-tiered system, and its strengthened goal of restricting wood burning.

Figure 2 District's Check Before You Burn Graphic



The District's robust, annual, multimedia outreach campaigns have helped the Valley achieve significant PM2.5 improvement since the adoption of Rule 4901 and resulted in an increase in public awareness and participation in District programs. Since the inception of *Check Before You Burn*, the District's air quality information tools such as

the Real-Time Air Advisory Network (RAAN) and the “Valley Air” mobile app have also grown in popularity. In a 2017 public survey, the District found that 85% of residents in the Fresno and Bakersfield metropolitan areas were familiar with *Check Before You Burn*.

Figure 3 District RAAN and iPhone App Images



The District’s outreach campaigns focus on the following:

- Educating the public and the media about the tiered episodic residential wood burning curtailment program
- Encouraging residents to upgrade to a clean-burning device through the *Burn Cleaner* grant program
- Notifying Valley residents about the District’s comprehensive planning process for PM2.5 attainment
- Educating the public on how to get their clean burning devices inspected and registered with the District
- Informing the public of poor air quality when those conditions arise

The District’s emphasis is on reaching communities that might be heavily impacted by neighborhood smoke from older devices and open-hearth fireplaces and also maintains a steady amount of *Check Before You Burn* awareness ads that guide the public to the District’s many resources that offer the daily wood burning status information. Valley residents are encouraged to call the District’s 1-800 number (1-800-SMOG-INFO), check the website (www.valleyair.org/CBYB), check their local news outlet, look for notifications on their smart phone or visit social media to determine their county’s wood burning status. The District maintains partnerships with television, digital radio, outdoor and movie theaters, as well as social media and digital/web advertising.

Traditional Media

The District’s successful *Check Before You Burn* outreach campaign utilizes television, cable and outdoor billboards. The District runs advertising on broadcast television

stations in the Valley, including Spanish stations, and cable networks across the Valley. The District benefits from well-established relationships with Valley meteorologists and daily wood burning status announcements in the weather segments of the evening television news and local radio broadcast news.

The *Check Before You Burn* messages are on outdoor billboards located within Valley communities and along highways and major corridors. Outdoor messaging are strategically located in high-traffic areas as well as neighborhood and rural communities to ensure a wide reach in those areas where residential wood burning might be common. The outdoor campaign garners millions of impressions each year, a key social media metric representing interactions between advertisements and the target audience.



Non-traditional Media

The District has created a versatile campaign utilizing new media trends to reach Valley audiences, including: Pandora (digital radio), high speed internet TV (also known as Over the Top Television (OTT) like Apple TV and Amazon Firestick or Connected TV (CTV) which uses smart televisions to connect directly to the internet without a device) and digital online messaging.

Utilizing OTT and CTV allows the District to share its message to Valley residents that no longer watch mainstream network television. Both Pandora and digital web campaign messaging allow the District to target certain listener demographics and behaviors in specific geographic areas. This platform allows listeners to respond to the message and actively click web banners to visit the valleyair.org site and check their county's wood burning status.

The District's strategic digital online campaigns provide impressions in front of adults 35+ living in the Valley that indicate certain behavioral tendencies. This allows both English and Spanish *Check Before You Burn* ads to run on media sites as well as major network sites covering News, Travel, Shopping, Sports and Entertainment. Audiences

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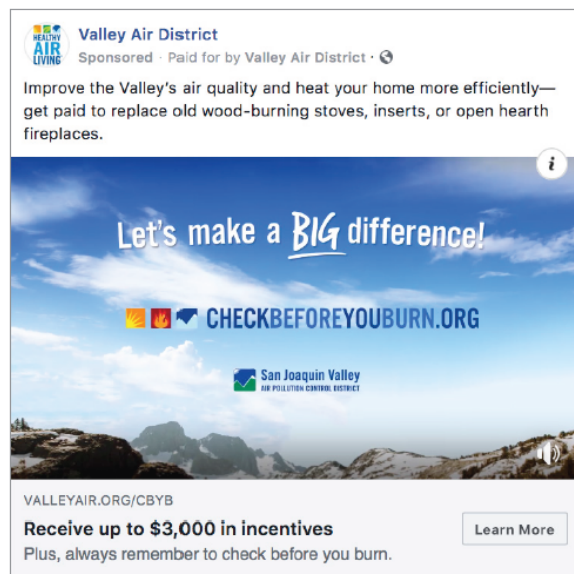
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throughout the Valley view web banners, mobile banners and short pre-roll videos—all of which are clickable and can connect individuals to more *Check Before You Burn* information. These web campaigns annually generate millions of impressions and thousands of clicks directly to valleyair.org/CBYB.

Social Media

Check Before You Burn messaging dominates the District's wintertime Facebook and Twitter posts and generate healthy dialogue within the social media community. The District's outreach campaign includes Facebook advertising in English and Spanish, geographically targeted in the District's three regions. Facebook users are shown a variety of ads, both video and static, during the winter campaign that implores them to *Check Before You Burn*, switch to a clean burning device, and help improve the Valley's air quality. The ads are clickable allowing users to actively visit the District's *Check Before You Burn* page and check the daily wood burning status for their county. These campaigns garner millions of impressions each year.



Health Air Living Schools

The District also incorporates wood-burning messaging into other public outreach products, including *Healthy Air Living Schools* materials, *Healthy Air Heroes* kids activity kits aimed at elementary school students and their parents, the *Healthy Air Living Kids Calendar* for kindergarteners through high school students; and other materials.

Figure 4 District Healthy Air Living Graphics



Valleyair.org and Mobile App

The District's daily residential wood burning status page (www.valleyair.org/CBYB) provides links to all the services, incentives and wood burning information necessary for Rule 4901. Additionally, the District provides a separate, easily accessible portal for Valley residents to register their clean burning devices. This portal works well for residents wanting to take advantage of the "no burning unless registered" daily status.

From November through February, the *Check Before You Burn* daily status page is the most visited page on valleyair.org, garnering hundreds of thousands of page views and nearly half of the total traffic to valleyair.org, indicating a familiarity among users and success of the digital (web) advertising campaigns which provide users a direct link.

Additionally, after launching a completely revamped mobile app in 2018, the District saw a significant increase in downloads (over 10,000 to date) and use of the app, which provides the daily wood burning status during the *Check Before You Burn* season.

Public Inquiries

Valley residents continue to call the District's toll free Smog-INFO line, which provides the daily burn status by county in both English and Spanish. The District receives several thousand public inquiries through the District's toll-free SMOG-INFO number during the residential winter season.

D. SCIENTIFIC PUBLIC SURVEY

Given the significant public health benefits that can be realized cost-effectively from reductions in wood smoke emissions and to ensure continued effectiveness of the current strategy and explore potential enhancements, on June 15, 2017, the District entered into a contract with Gomez Research to conduct a bilingual scientific survey in late 2017 to assess residential wood burning behaviors in the Valley.¹⁶ Gomez Research surveyed over 1,500 Valley residents through an approach that consisted of both a general, random population of residents throughout the Valley as well as a supplemental sample, or "high-incidence area," of 500 residents living in targeted zip

¹⁶ Gomez Research. *Residential Wood Burning Survey*. January 18, 2018. Retrieved from http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2018/January/final/10.pdf

codes believed to have higher concentrations of wood burning devices. Overall, the large survey response by Valley residents provides statistically significant results that can be relied upon to enhance our understanding of residential wood burning behavior in the San Joaquin Valley. The survey results, as detailed below, support lowering the residential wood burning curtailment thresholds, coupled with enhanced public outreach and increased incentive amounts for the *Burn Cleaner Program*.

Scientific studies show that prolonged inhalation of wood smoke contributes to lung disease, pulmonary arterial hypertension, and pulmonary heart disease, which can eventually lead to heart failure. However, survey findings suggest that of Valley residents that engage in wood burning, only 36% are aware of the detrimental health impacts associated with wood smoke. It is reasonable to conclude that with enhanced public education, more Valley residents could be persuaded to refrain from wood burning. The survey findings also suggest that of Valley residents who have a wood burning device, the majority (by a 3 to 1 margin) are English speaking and most (by a greater than 2 to 1 margin) have above-median income. Therefore, the following actions are supported by the survey and included in the recommended strategy enhancements:

- Strong public education highlighting the effectiveness and low cost associated with residential wood burning curtailment regulations as compared to alternative regulations with great direct or indirect cost to Valley businesses and residents.
- Increase emphasis on health impacts of wood smoke through messaging within paid advertisements, educational videos, brochures and other outreach opportunities.
- Target a greater share of the outreach at the Valley's English-speaking population with above-median incomes.

Survey results indicate that the District has made significant gains in educating the public about the *Burn Cleaner Program* over the past few years. Twenty-four percent of the general population residents surveyed reported that they had heard of the *Burn Cleaner* incentives program, a statistically significant increase over the 17% reported in 2014. Furthermore, the number of Valley residents willing to switch to a cleaner device has increased from 29% in 2014 to 36%. Despite these improvements, smoke from residential wood burning is still a significant source of particulate matter in the Valley during the winter. Increasing the turnover of old, polluting wood-burning devices is still a key component of the District's PM_{2.5} control strategy, so the District must continue to look for ways to increase program participation. More respondents were willing to purchase with at least a 75% incentive than they were initially without an incentive, indicating that increased, targeted incentives funding in this region would be more effective than targeting other regions. Therefore, the following actions are supported by the survey and included in the recommended strategy enhancements:

- Increase the incentive amount offered in the Valley's Hot Spot areas.

- Increase the use of clean wood burning units through continued regulatory incentives by offering residents who switch to clean burning units more days to use their devices.
- Continue to offer greater financial incentives for natural gas conversion.

With respect to Valley residents' compliance with the District's burn prohibitions, the survey results, although sample size is limited, are in line with the District's observations through extensive field enforcement activities that illustrate a high compliance rate. The overwhelming majority of the Valley residents (85%) believe that the current rule restrictions are either appropriate or too aggressive. As the District contemplates future changes to the rule, these survey results may indicate that continued high compliance rate might diminish resulting in a negative impact on air quality. However, attaining the latest federal standards is not possible without additional reductions from residential wood burning devices. As public acceptance is a key factor in achieving the desired compliance rate and resulting emission reductions, for the changes to be effective, incorporating all of the following components in the program is imperative:

- Meaningful financial incentives for upgrading to cleaner units.
- Maintaining regulatory incentives for Valley residents who switch to clean burning units.
- Increase emphasis on health impacts of wood smoke through messaging within paid advertisements, educational videos, brochures and other outreach opportunities.
- Strong public education highlighting the effectiveness and low cost associated with residential wood burning curtailment regulations as compared to alternative regulations with great direct or indirect cost to Valley businesses and residents.
- Continue strong enforcement.

V. PROPOSED AMENDMENTS TO DISTRICT RESIDENTIAL WOOD BURNING EMISSIONS REDUCTION STRATEGY

Despite significant reductions in population exposure to unhealthy pollution concentrations, under the federal Clean Air Act the entire Valley is designated as not meeting the federal standard if only one monitor exceeds the standard. Considering the significant gap that remains after including an exhaustive list of aggressive potential measures, the District needs to focus resources on the control measures and areas in the Valley that will be most cost-effective and most impactful towards achieving attainment. During the development of the District's *2018 PM_{2.5} Plan*, staff evaluated all potential opportunities to continue to reduce emissions and expedite attainment of the federal air quality standards for PM_{2.5}. Given the demonstrated effectiveness of the current residential wood burning program on improving air quality, the District identified Rule 4901 as a feasible opportunity to further reduce emissions of directly emitted PM_{2.5} in the Valley.

As part of adopting the *2018 PM_{2.5} Plan*, the District's Governing Board directed staff to immediately commence with the public process for amending the strategy in time for implementation by the upcoming 2019-20 winter season. The District began a public process for seeking feedback on potential amendments to the strategy, including holding public workshops in December 2018 and April 2019, meeting with hearth retailers to discuss potential enhancements to the *Burn Cleaner Program*, meeting with realtors to discuss potential amendments, and discussions with the District's Citizen Advisory Committee and Environmental Justice Advisory Group. The following summarizes proposed enhancements to the District's strategy in each of these areas.

A. PROPOSED AMENDMENTS TO RULE 4901

The *2018 PM_{2.5} Plan* includes commitments for enhanced Valleywide measures and targeted measures focused in specific Hot Spot areas of the Valley (Madera, Fresno, and Kern counties) that will achieve further emission reductions where they are needed most to protect public health and help the Valley attain federally mandated air quality standards. The proposed Valleywide amendments to Rule 4901 include new requirements for significant remodels of a fireplace or chimney that require the removal of open hearth fireplaces or replacement to cleaner devices, only allowing seasoned wood to be burned, enhanced compliance during transfers of residential real property, further restrictions on installations of new wood burning devices, and enhanced visible emission limitations.

Lower Wood Burning Curtailment Thresholds for Hot Spot Counties (Madera, Fresno, and Kern)

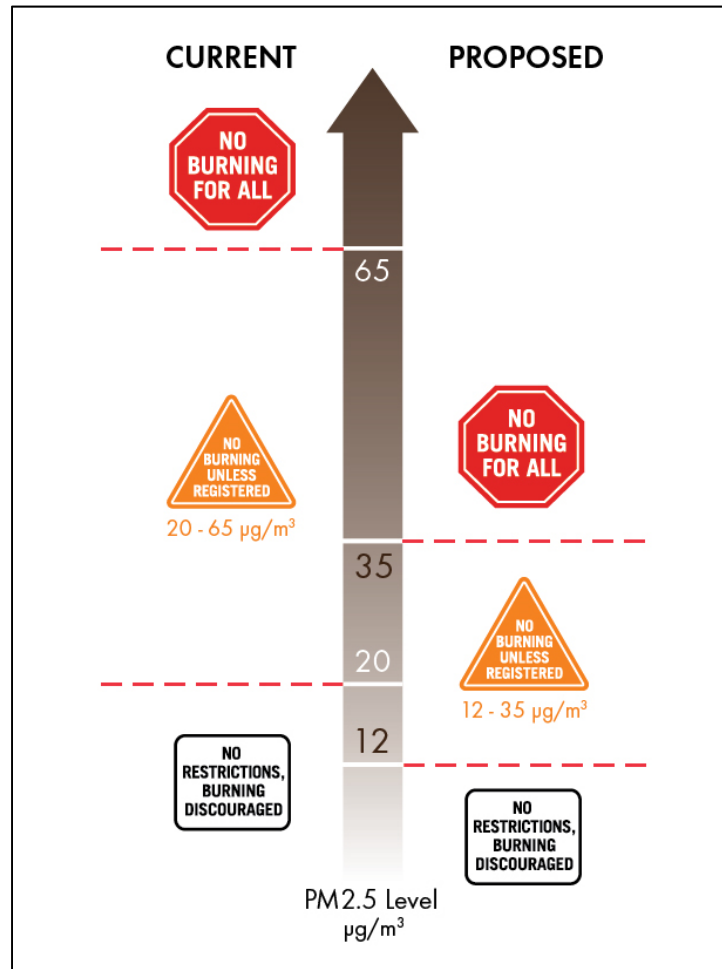
Despite significant reductions in population exposure to unhealthy pollution concentrations, under the federal Clean Air Act the entire Valley is designated as not meeting the federal standard if only one monitor exceeds the standard. Extensive modeling for the *2018 PM_{2.5} Plan* concluded that after incorporating an exhaustive list of aggressive potential measures Valley wide, additional emissions reductions would still be required in the counties of Madera, Fresno, and Kern to reach attainment by the mandated deadlines. As a result, the *2018 PM_{2.5} Plan* includes commitments for more stringent wood burning curtailment levels in Hot Spot areas (Madera, Fresno, and Kern counties), that will achieve further emission reductions where they are needed most to protect public health and help the Valley attain federally mandated air quality standards.

The proposed amendments to Rule 4901 would establish more stringent curtailment levels in the Hot Spot counties of Madera, Fresno, and Kern as follows (see Figure 1 for graphical representation):

- Lower the "No Burning Unless Registered" threshold (Level One) from the current level of 20 µg/m³ to 12 µg/m³, and
- Lower the "No Burning for All" threshold (Level Two) from the current level of 65 µg/m³ to 35 µg/m³.

For all non-Hot Spot counties of the Valley, the District proposes to maintain the current curtailment thresholds.

**Figure 5 Current and Proposed Curtailment Thresholds in Hot Spots
(Counties of Madera, Fresno, and Kern)**



The following tables provides the potential number of wood burning prohibitions that may occur in each of the Hot Spot counties at the proposed curtailment thresholds. These estimates are based on observed PM2.5 concentrations over the last five winter seasons. Due to the proposed lower curtailment thresholds, there will be an increase in the number of curtailment days within these counties.

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Table 3 Level One Curtailments in Hot Spot Counties (Proposed and Current)

County	Curtailment Days Proposed Threshold (≥ 12 and ≤ 35 $\mu\text{g}/\text{m}^3$)	Curtailment Days Current Threshold (≥ 20 and ≤ 65 $\mu\text{g}/\text{m}^3$)	Additional Curtailment Days
Fresno	71	57	14
Kern (SJV)	61	54	7
Madera	68	45	23

Table 4 Level Two Curtailments in Hot Spot Counties (Proposed and Current)

County	Proposed Threshold (> 35 $\mu\text{g}/\text{m}^3$)	Current Threshold (> 65 $\mu\text{g}/\text{m}^3$)	Additional Curtailment Days
Fresno	20	3	17
Kern (SJV)	22	4	18
Madera	12	1	11

To assist Valley residents to replace wood burning devices with cleaner natural gas units in these counties with more stringent curtailment thresholds, the District is proposing to offer enhanced incentives to fund the replacement of wood burning devices with clean burning gas devices as discussed further below.

In addition to the more stringent curtailment thresholds for the Hot Spot counties, the proposed amendments to Rule 4901 also include the following Valley wide changes:

Applicability (Section 2.0)

Section 2.3 would be amended to extend the applicability of the rule to all real property sales and transfers.

Section 2.4 would be amended to remove “in a new residential development” to clarify that the rule applies to any person who installs a wood burning fireplace, regardless of whether it is for a new, existing, business or residential development.

Definitions (Section 3.0)

The Definitions section of the rule would include new or amended definitions to clarify existing rule requirements and to support new rule requirements. As a result of the amendments to Section 3.0, the numbering will also be affected. For purposes of this staff report, the following amendment summaries are discussed using the updated numbering.

- The definition of an “EPA Certified” wood burning heater would be clarified with specific references to the Code of Federal regulations.

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- “New Residential Development” would be removed as the proposed amendment would apply more broadly to any residential developments.
- “Normal Operating Conditions” would be amended to include the addition of fuel to fire and the extinguishing of fire as part of the normal operating conditions. These events would no longer be exempt from the visible emission requirements.
- “Real Property” definition has been updated to remove extraneous examples.
- A “Remodel” definition has been added to clearly identify the types of modifications that are subject to the new proposed rule requirements.

Section 5.2 (Sale or Transfer of Residential Real Property)

This section currently requires that during the sale or transfer of all real residential properties, the seller submit verification of compliance to the buyer and the District that wood burning heaters on the property are compliant or exempt at the time of heater purchase/install or such devices have been rendered permanently inoperable. This is currently only required for properties with wood burning heaters (all other homes currently exempt).

The District has found that there is considerable confusion amongst sellers and realtors on the submittal of this form due to the limited subset of transactions subject to the requirement, which has led to inconsistent submittals of the verification of compliance forms and compliance challenges. In order to provide consistency and ease to realtors and sellers, this amendment would require the submittal of the verification of compliance form for the sale or transfer of all residential properties.

Section 5.3 (Significant Remodels of Fireplace or Chimney)

A new requirement would be added to only allow the installation of an EPA certified, gas-fueled, or electric device during a remodel of a fireplace or chimney that exceeds \$15,000 and requires a building permit where the application for the permit is submitted after January 1, 2020. A remodel is defined as a physical modification to a fireplace or chimney that impacts the physical structure of the fireplace or chimney. Aesthetic modifications that do not affect the physical structure of the fireplace are not considered a remodel, i.e. installing decorative stone/tile in front of fireplace.

Section 5.4 (Limitations on Wood Burning Fireplaces or Wood Burning Heaters)

The current requirements regarding the installation of new devices (Section 5.4) would remain in effect until December 31, 2019 and are summarized as follows

- If >2 dwellings/acre
 - No wood burning fireplaces (open hearth) may be installed
 - No more than two certified wood burning heaters may be installed
- If ≤2 dwellings/acre
 - No more than one wood burning fireplace or certified wood burning heater per dwelling may be installed

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Beginning on January 1, 2020, the following proposed restrictions on the installation of new wood burning devices would take effect.

- For areas below 3,000 feet elevation with natural gas service
 - No installation of wood burning fireplaces, low mass fireplace, masonry heater, or wood burning heaters
- For areas at or above 3,000 feet elevation or areas without natural gas service
 - No installation of more than two certified devices per acre (limited to one per dwelling unit)
 - No installation of wood burning fireplaces or non-certified wood burning heaters

Section 5.6 (Prohibited Fuel Types)

Proposed amendments would add non-seasoned wood to the list of fuel prohibitions.

Section 5.7.3 (Contingency Provision)

Consistent with the District's *2018 PM_{2.5} Plan*, this amendment would add a contingency provision. This would require that on and after sixty days following the effective date of EPA final rulemaking that the San Joaquin Valley Air Basin has failed to attain the 1997, 2006, or 2012 National Ambient Air Quality Standard by the applicable attainment date specified in the EPA-approved *2018 PM_{2.5} Plan* adopted by the District Governing Board on November 15, 2018, the PM_{2.5} curtailment levels for any county that has failed to attain the applicable standard shall be lowered to the curtailment levels in place for Hot Spot counties (5.7.1.2 and 5.7.2.2) as follows:

- Lower the "No Burning Unless Registered" threshold (Level One) from the current level of 20 µg/m³ to 12 µg/m³, and
- Lower the "No Burning for All" threshold (Level Two) from the current level of 65 µg/m³ to 35 µg/m³.

Section 5.8 (Visible Emissions Limitations)

The current rule requires that under normal operating conditions, no person shall cause or allow any visible smoke from a registered wood burning heater. The proposed amendment to Section 5.8 of Rule 4901 would clarify this existing requirement and add a visible emission limit to wood burning fireplaces and non-registered wood burning heaters as follows:

- Under normal operating conditions, no person shall cause or allow any visible smoke from a registered wood burning heater.
- Under normal operating conditions, no person shall cause or allow from a wood burning fireplace or nonregistered wood burning heater a visible emission of any air contaminant, other than uncombined water vapor, that exceeds No.1 on the Ringelmann Chart or 20 percent opacity for a period or periods aggregating more than three (3) minutes in any one (1) hour.

The rule originally noticed on May 21, 2019, exempted limited periods of startup, adding fuel, and extinguishing the fire from the definition of normal operating conditions. Upon further evaluation, staff have determined that adding fuel and extinguishing the fire should not be excluded from the definition of “normal operating conditions,” and therefore, consistent with the April 11, 2019, draft rule available for public comment, the limited exemption from visible emission requirements for these activities has been removed from the proposed final draft of the rule.

Section 7.0 (Test Methods)

Section 7.3 would be added to include Method 9 as a test method for proposed visible emission limit.

Clarifications to Existing Rule Requirements

Proposed amendments will simplify rule language and clarify requirements through the removal of redundant and expired language in the rule and through new and revised definitions.

B. ENHANCEMENTS TO THE DISTRICT’S BURN CLEANER INCENTIVE PROGRAM

The District’s strategy to reach attainment of the federal PM_{2.5} standards relies heavily on incentive programs to achieve cost-effective emission reductions of direct PM_{2.5} and PM_{2.5} precursors. Given the enormity of emissions reductions necessary to bring the Valley into attainment of the 1997, 2006, and 2012 federal PM_{2.5} standards, the Valley cannot reach attainment through regulatory measures alone, and significant additional emissions reductions through incentive-based measures are necessary.

The District’s Burn Cleaner Wood Stove Change-out Program (*Burn Cleaner Program*) plays a key role in the success of the transition from older more polluting wood burning heaters and fireplaces to cleaner wood burning heaters. Since 2006, the *Burn Cleaner Program* has been helping residents overcome some of the financial obstacles in purchasing cleaner alternatives. The District works with its program partners and is also actively engaged with the community and hearth industry to encourage participation in the program, particularly among low-income Valley residents.

Results from a recent scientific survey in 2017 indicate that the District has made significant gains in educating the public about the Burn Cleaner program over the past few years. The survey also identified potential opportunities, including increasing outreach effectiveness through more communication regarding the health impacts associated with wood burning emissions and increasing interest in transitioning to cleaner devices through financial and regulatory incentives. Twenty-four percent of the general population residents surveyed reported that they had heard of the *Burn Cleaner* incentives program, a statistically significant increase over the 17% reported in 2014. Furthermore, the number of Valley residents willing to switch to a cleaner device has

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increased from 29% in 2014 to 36%. Despite these improvements, smoke from residential wood burning is still a significant source of particulate matter in the Valley during the winter. Increasing the turnover of old, polluting wood-burning devices is still a key component of the District's PM_{2.5} control strategy, so the District must continue to look for ways to increase program participation. More respondents were willing to purchase with at least a 75% incentive than they were initially without an incentive, indicating that increased, targeted incentives funding in this region would be more effective than targeting other regions.

The District continues to take proactive steps to enhance the *Burn Cleaner Program* and as such, proposes the following changes to the District's current *Burn Cleaner Program* as a complementary strategy to the proposed regulatory amendments:

Hot Spot Incentive Amounts (Madera, Fresno, and Kern Counties)

To support the implementation of the proposed enhanced curtailment thresholds in Hot Spot counties and to maximize the effectiveness of limited available resources, the District proposes to amend the *Burn Cleaner Program* as follows based on program results to date and findings from the 2017 scientific public survey (all incentive options require replacement of eligible wood burning devices):

1. Offer increased maximum funding level of \$3,000 for the purchase of a natural gas-fired unit (includes \$500 for installation) to all applicants residing in areas of Hot Spot counties with access to natural gas.
2. Offer new incentive option for the purchase and installation of electric heat pumps as follows at a maximum funding level of:
 - a. \$4,000 per unit to all applicants residing in areas in Hot Spot counties with access to natural gas
 - b. \$1,500 per unit to applicants residing in areas of Hot Spot counties without access to natural gas (additional \$1,500 for low-income applicants)
 - c. \$1,500 per unit to applicants residing in Valley counties outside of Hot Spot areas (additional \$1,500 for low-income applicants)
3. Limit incentive options in areas of Hot Spot counties with access to natural gas to only fund the purchase and installation of natural gas and electric devices, and maintain current incentive levels for applicants residing outside of Hot Spot counties and in areas of Hot Spot counties without access to natural gas.

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**Table 5 Proposed Incentives for Hot Spot Counties
(Madera, Fresno, Kern)**

Location	Incentive Level
Areas with Access to Natural Gas	Up to \$3,000 for natural gas unit (\$2,500 for unit + \$500 for install) Up to \$4,000 for electric heat pump unit Available to all applicants regardless of income level
Areas without Access to Natural Gas	Up to \$1,000 for eligible certified or pellet wood devices Up to \$1,500 for propane unit (\$1,000 for unit + \$500 for install) Up to \$1,500 for electric heat pump unit Additional \$1,500 for qualified low-income applicants

**Table 6 Proposed Incentives for Other Valley Counties
(San Joaquin, Stanislaus, Merced, Kings, Tulare)**

Incentive Level
Up to \$1,000 for eligible certified or pellet wood devices Up to \$1,500 for natural gas/propane unit (\$1,000 for unit + \$500 for install) Up to \$1,500 for electric heat pump unit Additional \$1,500 for qualified low-income applicants

Emission Reductions from Proposed Amendments to District Residential Wood Burning Emissions Reduction Strategy

The proposed strategy is estimated to achieve 0.42 tons per day of directly-emitted PM2.5, based on an annual daily average. This includes potential emissions reductions that would be achieved from the proposed amendments to Rule 4901 and the transition from higher polluting wood burning devices to cleaner units through the *Burn Cleaner Program*.

C. ENHANCED CHECK BEFORE YOU BURN CAMPAIGN OUTREACH AND EDUCATION

The success of implementing the proposed amendments to the residential wood burning program will hinge on the expansion of the District's comprehensive multi-lingual residential wood burning outreach and education program. The District has an extremely successful outreach and education program with regards to residential wood burning and educating Valley residents about air quality, the effects of air pollution on the population's health, and on options residents can take to reduce emissions.

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In the District's latest public opinion survey conducted in 2017, 85% of residents in the Fresno and Bakersfield metropolitan areas indicated they were familiar with *Check Before You Burn*, the District's public education effort most recognized by Valley residents. Elsewhere in the Valley, 63% of residents know about the program.

The District's seasonal public outreach advertising campaign is retooled each year to include timely and relevant messaging. In the past few seasons, this messaging has been delivered by the District's Governing Board members, with strategically placed outdoor billboards in English and Spanish, targeted radio and TV spots, and value-added messaging delivered through media throughout the Valley.

The key message of this outreach is to ask residents to assess their county's wood burning curtailment status by calling the District's 1-800 number, checking the *Check Before You Burn* website, Valley Air app, or local news outlets, and visiting social media. The District maintains partnerships with television, newspaper, radio, print media and outdoor advertising, as well as non-traditional media, such as on-screen messaging in local movie theaters, internet advertising and video loops in medical offices.

As the District moves forward with enhancements to the residential wood burning strategy, it is essential that the public outreach and education campaign be designed to support the new strategy and its intended outcomes. Utilizing the results from the 2017 scientific survey, the public outreach and education campaign will focus on:

- Strong public education highlighting the effectiveness and low cost associated with residential wood burning curtailment regulations as compared to alternative regulations with great direct or indirect cost to Valley businesses and residents.
- Increase emphasis on health impacts of wood smoke through messaging within paid advertisements, educational videos, brochures and other outreach opportunities.
- Leveraging our partnerships with Healthy Air Living Schools to conduct education regarding the importance of reducing wood smoke emissions.
- Expanding partnerships with cities, counties, health providers, and other local organizations to conduct education regarding the importance of reducing wood smoke emissions, including through increased participation in health fairs, public events, and presentations.
- Targeting a greater share of the outreach at the Valley's English-speaking population with above-median incomes.
- Encouraging residents to upgrade to cleaner certified devices and take advantage of the enhanced *Burn Cleaner Program*.

The District is prepared to work with retail partners, media partners, schools, and non-profit organizations to launch these new outreach and education efforts immediately after the adoption of proposed amendments.

D. ENHANCED ENFORCEMENT

To optimize rule effectiveness and reduce the public health impact of wood smoke, the District dedicates extensive staffing resources to operate a robust Rule 4901 enforcement program covering all aspects of the rule. The District's strategy focuses on both compliance assistance and enforcement activities.

On all curtailment days, the District dedicates significant staffing resources to conducting surveillance in neighborhoods and responding to complaints from members of the public to ensure compliance with the rule. The District treats fireplace surveillance and complaint response as the highest priority enforcement activity. On each curtailment day, a substantial number of the District's inspection staff are assigned to perform surveillance with a focus on areas where non-compliance with the rule has been historically high and/or where public complaints regarding burning have been common. Notwithstanding this focus, the District works to ensure that surveillance is conducted regularly in all areas subject to regulatory curtailments. In addition to the surveillance and complaint response conducted during normal business hours, the District also conducts surveillance and complaint response on weekends, holidays, and during nighttime hours.

Due to the vast geographic area covered by the District, the public plays a vital role in ensuring compliance with the curtailment requirements of Rule 4901. Even with strong public awareness and the high compliance rate discussed above, the District regularly receives complaints regarding residential wood burning and responds to each of the complaints in a timely manner.

To aid in the active and effective enforcement of Rule 4901, the District leverages technologies such as global positioning systems (GPS) and low-light imaging cameras. Each District enforcement vehicle is equipped with GPS, which gives a precise location in real-time of all vehicles using a web-based tool. Using GPS, the District can ensure optimal assignment of complaints to minimize response times and can track/manage routes for surveillance activities. The District utilizes low-light imaging technology designed to work with a single-lens reflex camera to facilitate enforcement of the Rule during nighttime hours. Cameras utilizing this technology can visualize and document visible smoke in low- to no-light conditions. The District prides itself on using the latest in technology to enhance its already robust enforcement of the Rule requirements.

When violations of the Rule 4901 curtailment provisions are documented, a Notice of Violation is issued which carries a \$100 penalty for first-time violations. Residents cited under the rule may either pay the \$100 penalty or pay \$50 and attend the District's residential wood burning "Smoke School". Smoke school focuses on the challenges and goals of the District as well as providing additional education about the Rule 4901 requirements and how to ensure compliance moving forward. The majority of the violations are first-time offenses. For residents who incur repeat violations of the rule,

the monetary penalties issued by the District are significantly escalated to deter future non-compliance.

To effectively enforce the provisions of the Rule and to better respond to public complaints received at night and on weekend curtailment days, the District assigns staff hours for weekend and nighttime surveillance during the winter season.

In addition to the enforcement of the wood burning curtailments, the District provides outreach and education to real estate companies and associations regarding the disclosure requirements in the Rule and the requirement to remove from service any non-EPA certified wood burning devices at the time of property transfer. This includes presentations at association gatherings and one-on-one trainings as well as providing easy to understand pamphlets explaining the requirements and how to ensure compliance. Once submitted, the District reviews the required disclosures and takes appropriate enforcement action as necessary to ensure compliance with the Rule. In addition, the District works with city and county building departments to ensure that new residential developments are complying with the requirements to limit the number of wood burning devices.

The District is proposing further enhancements to this already robust and multifaceted enforcement strategy to ensure continued compliance with residential wood burning requirements, especially with the proposed more stringent wood burning curtailment thresholds. These additional enhancements include:

- Enhanced staffing resources dedicated to surveillance,
- Enhanced focusing of enforcement resources based on various parameters, including areas of concern and Hot Spot counties,
- Use of improved low-light camera technology to enhance effectiveness of nighttime enforcement, and
- The proposed enhancements to the visible emissions and transfer of residential real property requirements will enable more targeted enforcement.

E. AIR QUALITY FORECASTING

The District issues daily wood burning declarations during the months of November through February for the various forecast areas throughout the Valley. These declarations are issued based on a scientific modeling analysis of current and projected PM_{2.5} concentrations that also takes into account meteorological conditions and other factors that may impact the projected air quality. Based on this daily analysis, wood burning declarations are issued based on the forecasted PM_{2.5} concentrations for the following day, and a comparison of these forecasted concentrations against the curtailment thresholds established in Rule 4901.

Calling residential wood-burning curtailments at lower concentration levels minimizes direct PM_{2.5} emissions, thus lowering the rate of PM_{2.5} build-up during periods of

atmospheric stagnation. In these efforts, the District continually assesses air quality and meteorological forecasting tools to ensure that the most accurate and effective tools are being used to establish the daily air quality forecast. Since the proposed amendments to Rule 4901 include lowering the wood burning curtailment thresholds for Hot Spot counties, using the most accurate tools and models will become even more important as the proposed curtailment threshold of 12 $\mu\text{g}/\text{m}^3$ approaches background levels of PM_{2.5} in the Valley. Continuing to research and employ the best scientific air quality and meteorological models will be vital as the District's forecasting program is updated to focus on these proposed curtailment thresholds.

VI. ADDITIONAL ANALYSES

A. HEALTH BENEFITS

The District is a public health agency whose mission is to improve the health and quality of life for all Valley residents through efficient, effective and entrepreneurial air quality management strategies. The District periodically compiles attainment plans to identify individual regulations and other strategies that will achieve the emissions reductions needed for the Valley to meet federal health-based air quality standards. The District develops and implements both attainment plans and regulations to attain the federal air quality standards in the quickest, most health-protective, and most cost-effective manner. The control strategy as a whole, then, has important public health benefits and health costs savings. This amendment to Rule 4901 is one component of this overall control strategy.

B. EMISSION REDUCTION ANALYSIS

The total PM_{2.5} emission reductions achieved from the proposed amendments to the District's wood burning reduction strategy is estimated at 0.42 tons per day (tpd), on an annual average basis, as committed to in the *2018 PM_{2.5} Plan*. The total PM_{2.5} reductions from the enhanced curtailment is calculated at 0.26 tpd with an estimated additional reduction of 0.16 tpd from the proposed enhancements to the District's residential *Burn Cleaner Program*. Refer to Appendix B of this staff report for full details.

C. ECONOMIC ANALYSES

Cost Effectiveness Analysis

Pursuant to California Health & Safety Code (CH&SC) Section 40920.6(a), the District analyzes the cost effectiveness of new rules or rule amendments. The District has prepared a cost effectiveness analysis to analyze the economic feasibility of the proposed rule amendments. No significant socioeconomic impacts are expected from this rule project. Refer to Appendix C of the final draft staff report for these analyses.

Socioeconomic Analysis

Pursuant to CH&SC Section 40728.5(a), “Whenever a district intends to propose the adoption, amendment, or repeal of a rule or regulation that will significantly affect air quality or emissions limitations, that agency shall to the extent data are available perform an assessment of the socioeconomic impacts of the adoption, amendment, or repeal of the rule or regulation.” No significant socioeconomic impacts are expected from these rule amendments. Refer to Appendix C for the analysis for amendments to Rule 4901.

D. RULE CONSISTENCY ANALYSIS

Pursuant to Sections 40727 and 40727.2 of the California Health and Safety Code, prior to adopting, amending, or repealing a rule or regulation, the District performs a written analysis that identifies and compares the air pollution control elements of the rule or regulation with corresponding elements of existing or proposed District rules, existing statutes, and state and federal rules, regulations, and guidelines that apply to the same source category. The rule elements analyzed are emission limits, monitoring and testing requirements, recordkeeping and reporting requirements, and operating parameters and work practice requirements. Amendments to Rule 4901 do not conflict with any District or federal rules, regulations, or policies applicable to similar stationary sources, as demonstrated below.

District Rules

There are no other District prohibitory rules or regulations or fee rules tailored specifically for wood burning fireplaces or wood burning heaters; therefore, there are no rules in conflict with or inconsistent with the requirements of Rule 4901.

State Rules, Regulations, and Policies

There are no identified California state rules, regulations, or policies specific to reducing emissions from residential wood combustion.

Federal Rules, Regulations, and Policies

Rule 4901 is as stringent as the current federal New Source Performance Standards (NSPS) (40 CFR 60 Subpart AAA (Standards of Performance for New Residential Wood Heaters). Additionally there are no EPA Control Techniques Guidelines (CTG), Alternative Control Techniques (ACT), National Emission Standards for Hazardous Air Pollutants (NESHAP), or Maximum Achievable Control Technology (MACT) guidelines for this source category.

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EPA New Source Performance Standard (NSPS)

EPA published in the Federal Register on March 16, 2015, and effective May 15, 2015, amendments to 40 CFR Part 60 Subpart AAA.80 District Rule 4901 points to the New Source Performance Standards (NSPS) for emission limits and is therefore as stringent as the newly promulgated NSPS.

The 2015 NSPS significantly lowered the certification emission limits for wood-burning heaters that are required to be certified and sets certification limits for a broader range of wood-burning heaters by removing the existing certification criteria from the 1988 version of the rule. Standards apply not only to adjustable burn rate wood heaters (the focus of the original regulation), but also to single burn rate wood heaters/stoves, pellet heaters/stoves, and any other affected appliance as defined in revised Subpart AAA as a “room heater.”

Although pellet stoves did not require EPA certification under the 1988 NSPS, 96% of pellet heaters meet the new Step 1 PM emissions limit of 4.5 grams per hour. Single burn rate wood heaters are incapable of operating at the lowest burn rates, and it is the lower burn rates that result in the highest level of PM emissions; therefore, most single burn rate wood heaters also meet the Step 1 PM emissions limit. Manufacturers of such units were not initially required to modify their design if they already met the emissions standard and will automatically be deemed as certified to meet the Step 1 emission limits.

EPA promulgated a two-step compliance approach that applies to all new adjustable burn rate wood heaters, single burn rate wood heaters and pellet heaters/stoves. Under this approach, Step 1 emission limits for these sources apply to each unit manufactured on or after the effective date of the final rule (May 15, 2015) or sold at retail on or after December 31, 2015. Step 2 emission limits for these units apply to each heater manufactured or sold at retail on or after May 15, 2020. EPA is allowing an alternative compliance option for manufacturers who choose to certify using cord wood (rather than crib wood) to meet the Step 2 limits.

Table 7 Subpart AAA PM Emissions Limits

2-Step, 5-Year Phase-In		
Step	PM limit	Compliance deadline
1	4.5 g/hr	May 15, 2015
2	2.0 g/hr (crib wood test method)	May 15, 2020
	2.5 g/hr (cord wood alternative compliance option)	

E. CALIFORNIA ENVIRONMENTAL QUALITY ACT ANALYSIS

Based on the District's investigation, substantial evidence supports the District's conclusion that the amendments will not cause either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment, and as such is not a "project" as that term is defined under the California Environmental Quality Act (CEQA) Guidelines § 15378. In addition, substantial evidence supports the District's conclusion that assuming the amendment is a "project" under CEQA, it will not have any significant adverse effects on the environment.

The amendments to District Rule 4901 is an action taken by a regulatory agency, the San Joaquin Valley Air District, as authorized by state law to assure the maintenance, restoration, enhancement, or protection of air quality in the San Joaquin Valley where the regulatory process involves procedures for protection of air quality. California Environmental Quality Act (CEQA) Guidelines §15308 (Actions by Regulatory Agencies for Protection of the Environment), provides a categorical exemption for "actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. Construction activities and relaxation of standards allowing environmental degradation are not included in this exemption." No construction activities or relaxation of standards are included in this project. Therefore, the rule amendment project is exempt from CEQA.

In addition, according to Section 15061 (b)(3) of the CEQA Guidelines, a project is exempt from CEQA if, "(t)he activity is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA." As such, for this additional reason, the District finds that the rule amendment project is exempt from CEQA.

Pursuant to Section 15062 of the CEQA Guidelines, the District will file a Notice of Exemption upon Governing Board approval of amendments to Rule 4901.

VII. PUBLIC PROCESS FOR DEVELOPING PROPOSED AMENDMENTS

The District conducted a robust public process for developing the proposed amendments to Rule 4901 and the *Check Before You Burn* program. The public has been actively participating and providing feedback and comments on potential amendments to Rule 4901.

A. 2018 PM2.5 PLAN DEVELOPMENT

The District hosted ten public workshops and updates at public meetings such as the Governing Board meetings, Public Advisory Workgroup meetings, Citizen Advisory Committee meetings, and Environmental Justice Advisory Group meetings throughout the plan development process. Potential opportunities to reduce emissions were discussed at these meetings, including potential emission reductions opportunities from Rule 4901. Public comments specific to Rule 4901 were received throughout the plan development process and incorporated into the plan as appropriate.

B. PUBLIC WORKSHOPS AND MEETINGS FOR RULE 4901

The District hosted a public scoping meeting on December 12, 2018 to discuss potential amendments to District Rule 4901. The District hosted a public workshop to present draft amendments and receive public comments on April 11, 2019, followed by a two-week comment period. Both of these meetings were held in the evening hours at all three District offices. Comments received were evaluated and incorporated into the rules and staff report as appropriate. Refer to the final draft staff report for a summary of significant comments and District responses. In addition to the workshops, the District provided regular updates on the development of Rule 4901 at public meetings of the District's Citizen's Advisory Committee and Environmental Justice Advisory Group.

C. PUBLIC HEARING FOR RULE 4901

In accordance with CH&SC Section (§) 40725, the proposed amendments to Rule 4901 and summary description were publicly noticed and made available prior to the Governing Board public hearing to consider adoption of the proposed amendments. All significant comments received were considered and incorporated into the proposed rule and staff report, as appropriate. A summary of significant comments and District responses is available in Appendix A of this staff report. The public is also invited to provide comments on the proposed amendments to Rule 4901 and staff report during the public hearing on June 20, 2019.

APPENDIX A

Summary of Significant Comments and Responses

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**SUMMARY OF SIGNIFICANT COMMENTS
PROPOSED AMENDMENTS TO RULE 4901
RULE 4901(Wood Burning Fireplaces and Wood Burning Heaters)
May 15, 2019**

The San Joaquin Valley Air Pollution Control District (District) posted proposed amendments to Rule 4901 (Wood Burning Fireplaces and Wood Burning heaters) on the District web for public review and comment on May 15, 2019. Summaries of significant comments received are summarized below.

Comments were received from the following:

Laurie Slate, Miramar International Mill Rock (MIMR)
Glenn Porter, RE/MAX Golden Empire (RE/MAX GE)

Sale and Transfer of Real Property:

1. COMMENT: There are already strong regulations in place to disclose to homeowners rules regarding wood-burning stoves, and non-compliant appliances are already rendered inoperable or removed before most sales. Please consider that existing requirements already in place provide enough disclosures and protections for consumers and for the environment, and adding more documentation is redundant, serving only to complicate transactions while adding no value or benefit. If the statement of compliance form is furnished by the real estate agent to the client, what happens to the form? Who sends the form to the District? (MIMR, RE/MAX GE)

RESPONSE: Rule 4901 currently requires that during the sale or transfer of all real residential properties, the seller submit verification of compliance to the buyer and the District that wood burning heaters on the property are compliant or exempt at the time of heater purchase/install or such devices have been rendered permanently inoperable. This is currently only required for properties with wood burning heaters (all other homes currently exempt).

The District has found that there is considerable confusion amongst sellers and realtors on the submittal of this form due to the limited subset of transactions subject to the requirement, which has led to inconsistent submittals of the statement of compliance forms and compliance challenges. In order to provide consistency and ease to realtors and sellers, this amendment would require the submittal of the statement of compliance form for the sale or transfer of all residential properties.

**SUMMARY OF SIGNIFICANT COMMENTS
DRAFT AMENDMENTS TO RULE 4901
RULE 4901(Wood Burning Fireplaces and Wood Burning Heaters)
Public Workshop – April 11, 2019**

The District held a public workshop to present, discuss, and receive comments on the draft amendments to Rule 4901 on April 11, 2019. Summaries of significant comments received during the public workshop and associated comment period are summarized below.

Comments were received from the following:

Ann Dennis, Mountain Comforts (MC)
Thomas Menz (TM)
Rebecca Kay (RK)
Jim Ftacek, Cal Farm Stoves (CFS)
Jeanne Radsick, California Association of Realtors, (CAR)
Rick Jones, Central Valley Association of Realtors (CVAR)
Di Prado, California Building Products (CBP)
Steve Goldstein, Spa Doctor (SD)
Amanda Ott, Spa Doctor (SD)
Fran Hipskin, Tulare County Association of Realtors (TCAR)
Rod Wapiennik, America One Fireplaces (AOF)
Kim Schaeffer, Bakersfield Association of Realtors (BAR)
Bob Haun, Buck Stove (BS)
Jim Chisea, Abercrombie & Co Stoves (ACS)

Wood Burning Requirements:

- 1. COMMENT:** Are homes with sole-source of heat required to comply with the burn ban? If not, do the rule amendments require those homes to have certified stoves? (RK)

RESPONSE: Given the sole source of heat, while not subject to the curtailment requirements of this rule, homes under this category are subject to other provisions of Rule 4901, including visible emissions, transfer, prohibited fuels, and other requirements.

- 2. COMMENT:** The improvements in our industry are truly remarkable. The days of smoke belching wood stoves are truly behind us except for the public that does not use dry seasoned wood. The stoves that are coming out for the 2020 required "step 2" are going to be that much more sensitive to the operator and the quality of the wood used. Dealers in my industry have to educate their customers and make them aware of just how important it is to be educated clean burners for the benefit for all. (ACS)

RESPONSE: We appreciate the efforts made to transition to cleaner devices and to educate the public on the importance of reducing wood burning emissions.

Sale and Transfer of Real Property:

- 3. COMMENT:** When was the statement of compliance for the sale and transfer of real property required? Is the proposed amendment to require this form to be submitted for all sales and transfer of homes? (SD)

RESPONSE: The requirement for the submittal of the statement of compliance form has been in place since 2004. Rule 4901 currently requires that during the sale or transfer of all real residential properties, the seller submit verification of compliance to the buyer and the District that wood burning heaters on the property are compliant or exempt at the time of heater purchase/install or such devices have been rendered permanently inoperable. This is currently only required for properties with wood burning heaters (all other homes currently exempt).

The District has found that there is considerable confusion amongst sellers and realtors on the submittal of this form due to the limited subset of transactions subject to the requirement, which has led to inconsistent submittals of the statement of compliance forms and compliance challenges. In order to provide consistency and ease to realtors and sellers, this amendment would require the submittal of the statement of compliance form for the sale or transfer of all residential properties.

- 4. COMMENT:** Will all of Kern County have to comply with the rule requirements? The District doesn't have jurisdiction over all of Kern County, such as Ridgecrest and Mojave (CAR)

RESPONSE: Only the Valley-portion of Kern County that is under the jurisdiction of the San Joaquin Valley Air Pollution Control District is subject to the rule. Regions of the boundary details are located at http://valleyair.org/General_info/images/KernMap/KernBoundary.htm

- 5. COMMENT:** The District's strategy to reduce emissions from wood burning has been working effectively. The Burn Cleaner Retailers can provide assistance to the realtors and the public with the resources necessary to comply with the rule requirements, which include identifying and understanding the types of devices that are in the home. (SD)

RESPONSE: The District appreciates the partnerships with the hearth retailers and the offer to assist the realtors and the public in complying with rule requirements. The District agrees that joint efforts between hearth retailers participating in the Burn Cleaner program, realtors and associations within the San Joaquin Valley, and the District is needed to achieve further reductions from residential wood burning.

- 6. COMMENT:** I oppose the requirement to submit a statement of compliance form for all real estate transactions and recommend the District to not make any changes to the verification form submittal requirement. (CVAR)

RESPONSE: Section 5.2 of the rule currently requires that during the sale or transfer of all real residential properties, the seller submit verification of compliance to the buyer and the District that wood burning heaters on the property are compliant or exempt at the time of heater purchase/install or such devices have been rendered permanently inoperable. This is currently only required for properties with wood burning heaters (all other homes currently exempt).

The District has found that there is considerable confusion amongst sellers and realtors on the submittal of this form due to the limited subset of transactions subject to the requirement, which has led to inconsistent submittals of the verification of compliance forms and compliance challenges. In order to provide consistency and ease to realtors and sellers, this amendment would require the submittal of the verification of compliance form for the sale or transfer of all residential properties.

- 7. COMMENT:** We recommend the District to increase outreach to buyers and sellers and realtors regarding the statement of compliance requirements? (BAR, CAR)

RESPONSE: The District has worked with realty companies and associations to provide outreach and education regarding the disclosure requirements in the rule and the requirement to remove from service any non-EPA certified wood burning devices at the time of property transfer. This includes presentations at association gatherings and one-on-one trainings as well as providing easy to understand pamphlets explaining the requirements and how to ensure compliance. The District will increase outreach to the realtors and associations throughout the Valley and streamline form submittal process. In addition, the District will assist in building partnerships between realtors and hearth retailers, who have expertise in wood burning devices.

Visible Emissions Requirement:

- 8. COMMENT:** During startup, even clean EPA certified units using clean seasoned wood generate visible emissions. There should be a startup grace period. (SD, BS)

RESPONSE: The proposed amendment provides a grace period of 15 minutes for startups.

- 9. COMMENT:** The limits in Oregon is year-round, no more than 3 minutes at 20 percent opacity, does the 15 minute startup period that's allowed presently under Rule 4901 supersede the 3 minutes at 20 percent opacity limit or visa-versa? The District should implement the same limit as Oregon. (TM)

RESPONSE: The District's proposed amendments to visible emissions are significantly more stringent than the limit imposed by the state of Oregon. Unlike the District's proposed measure that would apply immediately upon adoption of the amendments, the Oregon Department of Environmental Quality (ODEQ) visible emission requirement under Chapter 340, Division 262 was adopted as a Contingency measure. While this contingency measure limits visible emissions to 20% opacity and applies during startup, this requirement does not apply to fireplaces, antique stoves, pellet stoves, masonry heater, and other devices that would be subject to the District's requirements. Additionally, per discussions with local enforcement agencies in Oregon, the startup provisions of the ODEQ contingency measure are not feasible to implement and are currently exempted from visible emissions requirements under local visible emissions ordinances.

Burn Cleaner Incentive Program:

10. COMMENT: If Tulare County becomes a hot-spot area in the future, would the enhanced incentive levels be applied to Tulare County? (BS)

RESPONSE: If additional counties become subject to the more stringent curtailment levels due to the proposed contingency measure, the District expects that the incentive levels would be adjusted as appropriate consistent with other Hot Spot counties.

11. COMMENT: Will propane units be applicable for enhanced incentive amounts? (MC)

RESPONSE: Enhanced incentives will be provided (subject to funding availability) in areas of the Valley subject to the more stringent Hot Spot curtailment levels included in the proposed amendments.

**SUMMARY OF SIGNIFICANT COMMENTS
RULE 4901(Wood Burning Fireplaces and Wood Burning Heaters)
Public Scoping Meeting – December 12, 2018**

The San Joaquin Valley Unified Air Pollution Control District (District) held a public workshop to present, discuss, and hear comments on strategies under consideration for reducing emissions from sources subject Rule 4901. Comments received during the public workshop and the associated two week commenting period following the workshop are summarized below.

Comments were received from the following:

Claire Strathorn (CS)
Genevieve Gale, Central Valley Air Quality Coalition (CVAQ)
Josh Simon, Tristate Distributors (TD)
Angela Islas, Central California Asthma Collaborative (CCAC)
Janet Dietz-Kamay (JDK)
Thomas Menz (TM)
John Crouch, Hearth, Patio & Barbeque Association (HPBA)
Colby Morrow (CM)

Wood Burning Requirements:

12. COMMENT: The District should consider the ban of all wood burning, including EPA certified in urban areas during winter time or establish a compliance date (i.e. October 1, 2020) to phase out the use of fireplaces (TM, JDK, CS)

RESPONSE: In developing the proposed amendments to the rule, the District evaluated a number of opportunities to build on the District's existing stringent regulation and further reduce emissions from wood burning. Through this robust evaluation and input received during the public engagement process, the proposed amendments include a number of enhancements that would apply Valleywide, lower curtailment levels in hot-spot areas coupled with increased incentives, and enhance the District's public outreach, enforcement, and forecasting programs. These enhancements result in a significant decrease in wood burning emissions that will improve public health and assist the Valley in expeditiously meeting the federal PM_{2.5} standards.

13. COMMENT: Recommend the District to consider lowering the level 2 (no burn for all) curtailment threshold to 30 ug/m³, such as implemented by BAAQMD. (TM)

RESPONSE: The District's current two-tiered curtailment thresholds of 20 µg/m³ for the high polluting devices and 65 µg/m³ for all devices are already significantly more stringent than the BAAQMD curtailment threshold, as the majority of emissions are

from the high polluting devices. The proposed amendments would further lower these stringent thresholds in the targeted hot-spot areas of Madera County, Fresno County, and Kern County from 20 µg/m³ to 12 µg/m³ for the high polluting devices and from 65 µg/m³ to 35 µg/m³ for all devices, while maintaining the existing thresholds for the remaining counties in the Valley. In addition, as a whole, the District rule is far more stringent than the BAAQMD rule.

- 14. COMMENT:** The District should consider requiring residents that have no other source of heat other than wood burning to use EPA certified devices. (TM)

RESPONSE: Given the sole source of heat, while not subject to the curtailment requirements of this rule, homes under this category are subject to other provisions of Rule 4901, including visible emissions, transfer, prohibited fuels, and other requirements. Additionally, the proposed program enhancements include incentive program enhancements to encourage more residents to transition to cleaner devices, including only funding natural gas or electric units in areas subject to the new curtailment thresholds.

Enhanced Outreach and Education:

- 15. COMMENT:** The District has made progress to enhance translation services in the Valley and should continue those efforts and expand to include other languages, such as Hmong and ensure translated outreach materials match the majority of the language spoken in the area. (CVAQ)

RESPONSE: The District appreciates the suggestions received for continued enhancement of its multilingual outreach efforts. The District's robust multimedia outreach campaign has helped the Valley achieve significant PM_{2.5} improvement since the adoption of Rule 4901 and resulted in an increase in public awareness and participation in District programs. The outreach campaign included Facebook advertising in English and Spanish geographically targeted in the District's three regions and digital online campaign in both English and Spanish. The District will explore Hmong and other media outlets as it continues to make progress in expanding public outreach and education efforts.

- 16. COMMENT:** The District should consider increasing public outreach for *Check Before You Burn* on Univision and Telemundo stations and ensure there are as much public outreach on those stations as compared to KSEE 24 or FOX 26. (CCAC)

RESPONSE: The District's outreach campaign utilizes television, cable and outdoor. The District runs an advertising campaign on more than 10 broadcast television stations in the Valley, including 3 Spanish stations, and cable networks across the Valley.

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17. COMMENT : What are some of the approaches that the District will take to enhance public outreach efforts? Recommend the District to implement more aggressive education campaign to bring awareness to Valley residents about the health impacts of wood burning. (CVAQ, CS)

RESPONSE: As described in the staff report, the District will continue to enhance public outreach efforts to expand focus on educating the public and the media about the new residential wood burning emission reduction strategy. To encourage residents to upgrade to cleaner certified devices and take advantage of the enhanced *Burn Cleaner Program*, educating Valley residents regarding the health impacts associated with wood smoke. The District will expand its emphasis on reaching communities that might be heavily impacted by neighborhood smoke from older devices and open-hearth fireplaces. The District appreciates all suggestions received for continuing to enhance public outreach and education efforts.

Enforcement:

18. COMMENT : The District should strengthen enforcement during those peak times of when wood burning occurs more frequently, during evenings after 5pm. (TM, CM)

RESPONSE: The District works to ensure that surveillance is conducted regularly in all areas subject to regulatory curtailments. In addition to the surveillance and complaint response conducted during normal business hours, the District also conducts surveillance and complaint response on weekends, holidays, and during nighttime hours. As described in the staff report, the District continues to pursue a number of enhancements with respect to enforcement, including investing in the latest technologies available to enhance our ability to detect and document violations of this rule during evenings.

19. COMMENT: The District should consider increasing fines as a strategy to reduce potential for violation of the rule when episodic curtailment is declared. (TM, JDK)

RESPONSE: When violations of the Rule 4901 curtailment provisions are documented, a Notice of Violation is issued which carries a \$100 penalty for first-time violations, with monetary penalties for repeat violations increased significantly, to deter future non-compliance. Residents cited under the rule for first time violations may either pay the \$100 penalty, or pay \$50 and attend the District's residential wood burning "Smoke School". Smoke school focuses on the challenges and goals of the District as well as providing additional education about the Rule 4901 requirements and how to ensure compliance moving forward. As has been the case in previous winter seasons, nearly all of the violations in the 2018-2019 season were first-time offenses, which validates the deterrent effect of the penalty levels.

APPENDIX B

Emission Reduction Analysis

June 20, 2019

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**EMISSION REDUCTION ANALYSIS FOR PROPOSED AMENDMENTS
RESIDENTIAL WOOD BURNING EMISSION REDUCTION STRATEGY**

I. SUMMARY

The total PM_{2.5} emission reductions achieved from the proposed amendments to the District's wood burning reduction strategy is estimated at 0.42 tons per day (tpd), on an annual average basis, as committed to in the *2018 PM_{2.5} Plan*. The total PM_{2.5} reductions from the enhanced curtailment is calculated at 0.26 tpd with an estimated additional reduction of 0.16 tpd from the proposed enhancements to the District's residential *Burn Cleaner Program*.

II. EMISSION REDUCTIONS FROM PROPOSED EPISODIC TIERED CURTAILMENT PROGRAM

As a conservative estimate for the purpose of claiming emission reductions in the SIP for proposed rule amendments, this emission reduction analysis will only account for those emissions reduced as a result of the proposed amendment to lower the episodic curtailment levels. The lower curtailment levels would apply to counties of Madera, Fresno, and Kern and may expand to remaining counties if triggered for contingency per Section 5.8 of the proposed rule. The current Level One episodic wood burning curtailment threshold of 20 µg/m³ for non-registered devices would be lowered to 12 µg/m³ and the current Level Two curtailment threshold of 65 µg/m³ for all wood burning fireplaces and heaters would be lowered to 35 µg/m³. Rule emission reductions would come from the sum of reductions from counties of Madera, Fresno, and Kern. Calculation for the other Valley counties (San Joaquin, Stanislaus, Merced, Kings, and Tulare) will be performed to quantify reductions for contingency purposes.

The calculation methodology in this analysis is based on the District's *2015 Area Source Emissions Inventory Methodology 610 – Residential Wood Combustion* document. This analysis consists of three steps:

- Step 1 determines the daily emissions from wood burning devices. Registerable devices are allowed to burn during level one episodic wood burning curtailment, per section 5.7 of the proposed rule, while non-registerable devices are prohibited from operating under both level one and level two episodic wood burning curtailments.
- Step 2 determines the emission reductions from additional episodic wood burning curtailment due to the proposed lower curtailment thresholds, using the calculated daily emissions from step 1 and estimated additional days of curtailment.
- Step 3 sums the emission reductions from the Hot Spot counties of Madera, Fresno, and Kern. Potential emissions reductions are also calculated for each remaining

county if triggered by contingency provisions per District's Rule 4901 Section 5.7.3 of the proposed rule.

The following details each of these steps.

STEP 1: DETERMINE DAILY AVERAGE EMISSIONS FROM REGISTERABLE AND NON-REGISTERABLE WOOD BURNING DEVICES

The emissions inventory is divided into two categories, one for fireplaces and one for wood stoves. The inventory is reported as a winter average, distributing the emissions over a 180 day period. This analysis will require that those emissions be converted to a daily average of emissions over the wood burning season. These daily emissions will be re-categorized into emissions from registerable and non-registerable devices.

The analysis for step 1 will be divided into the following:

- a. Determine emissions from fireplaces and wood stoves during winter season
- b. Convert daily winter average emissions to daily wood burning season average
- c. Determine the usage of each category of wood stove
- d. Determine the portion of emissions from each category of wood stove
- e. Determine the portion of emissions from registerable and non-registerable wood stoves
- f. Determine daily average emissions from wood stoves during the wood burning season
- g. Combine emissions from fireplaces and non-registerable wood stoves

The following provides the methodology, assumptions, and calculations for the emission reductions analysis for this step.

a. Determine emissions from fireplaces and wood stoves during winter season

The latest emissions inventory for residential wood burning can be found in CARB's inventory (CEPAM version 1.05)¹. This inventory provides emissions for residential wood burning from fireplaces and wood stoves and also provides annual and winter season daily averages. For the purposes of this evaluation, the winter season daily average emissions, representative of the 180 days between November and April, will be used as a starting point, as shown by the table below. The emissions inventory from 2020 is used in this analysis, as that is the first full year of emission reductions from the proposed rule change, based on rule adoption in 2019.

¹ CEPAM – NorCal v. 1.05 – Winter Average

Table B-1 2020 PM_{2.5} Winter Season Wood Burning Emission Inventory (tpd)

County	Wood Stoves	Fireplaces
Fresno	0.722	0.594
Kern (SJV)	0.391	0.421
Kings	0.057	0.083
Madera	0.128	0.084
Merced	0.337	0.197
San Joaquin	0.402	1.583
Stanislaus	0.417	0.455
Tulare	0.361	0.262

b. Convert daily winter average emissions to daily wood burning season average

The winter season includes the months of November through April (180 days). However, the wood burning season consists of the months of November through February (120 days). Because there is little to no residential wood burning activities during the months of March and April, all emissions are assumed to be limited to the wood burning season months of November through February.

To convert the daily average winter emissions into daily average wood burning season emissions, the inventory is multiplied by 180 days (winter season) and divided by 120 days (wood burning season).

$$E_S = \frac{E_W \times N_W}{N_S}$$

Where:

E_S = Daily average wood burning season emissions

E_W = Daily average winter emissions

N_S = Number of days in wood burning season

N_W = Number of days in winter season

Example: Calculating daily average wood stove emissions in Fresno County during wood burning season

$$E_S = \frac{0.722 \text{ tpd} \times 180 \text{ days}}{120 \text{ days}} = 1.082 \text{ tpd}$$

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This calculation was performed for each entry in Table B-1 above to create Table B-2 below.

Table B-2 2020 PM_{2.5} Wood Burning Season Emissions (tpd)

County	Wood Stoves	Fireplaces
Fresno	1.082	0.891
Kern (SJV)	0.586	0.631
Kings	0.085	0.125
Madera	0.192	0.127
Merced	0.506	0.295
San Joaquin	0.603	0.874
Stanislaus	0.625	0.682
Tulare	0.542	0.392

c. Determine the usage of each category of wood stove

Dividing the daily emissions for wood stoves into emissions from registerable and non-registerable devices will require looking closer at the wood stove category. The methodology used to determine the emissions inventory in table B-1 above uses 5 categories of wood stoves: pellet-fueled, compressed wood logs, conventional, EPA Phase II (non-catalytic), and EPA Phase II (catalytic).

In order to distribute the emissions from the wood stove category, this analysis will rely on the latest fuel usage data for wood stoves in the *2015 Area Source Emissions Inventory Methodology 610 – Residential Wood Combustion*². Table A-12 of that methodology includes baseline data for fuel use as well as emission factors from each type of wood stove. Data in Table B-3 and Table B-4 below are from this source.

Table B-3 All Wood Stoves – Fuel Use (tons/year)

County	Conventional	Phase II, Non-Catalytic	Phase II, Catalytic	Pellets	Compressed Wood Logs
Fresno	6,404	4,522	1,010	5,700	0
Kern (SJV)	3,758	2,101	268	3,932	0
Kings	504	306	39	773	0
Madera	822	1,032	394	877	0
Merced	3,122	1,823	301	1,923	0
San Joaquin	3,514	2,285	397	5,542	0
Stanislaus	4,158	2,421	397	4,429	0

² 2015 Area Source Emissions Inventory Methodology 610- Residential Wood Combustion. pp.48, Table A-12
Retrieved from:

https://www.valleyair.org/Air_Quality_Plans/EmissionsMethods/MethodForms/Current/ResidentialWoodCombustion2016.pdf

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Tulare	3,420	2,166	398	2,480	0
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Table B-4 PM2.5 Emission Factors (lb/ton-fuel-burned)

Conventional	Phase II, Non-Catalytic	Phase II, Catalytic	Pellets	Compressed Wood Logs
29.5	14.1	19.6	2.9	25

Distributing the emissions into each of these categories will allow the emissions to be regrouped into emissions from registerable wood stoves and non-registerable wood stoves later in this analysis.

d. Determine the portion of emissions from each category of wood stove

To calculate the percentage of wood burning stove emissions in each county by device type, the emissions from each device type is divided by the total emissions from all device types, as shown by the following formula:

$$R_D = \frac{F_D \times EF_D}{\sum_{i=Device\ Types} (F_i \times EF_i)} \times 100\%$$

Where:

R_D = Percentage of emissions for a given device type D

F_D = Fuel Use for a given device type D

EF_D = Emissions factor for a given device type D

Example: Calculating the percentage of wood stove emissions for conventional wood stoves in Fresno County

$$\begin{aligned}
 R_D &= \frac{6,404 \text{ tons/year} \times 29.5 \text{ lbs/ton}}{(6,404 \text{ tons/year} \times 29.5 \text{ lbs/ton}) + (4,522 \text{ tons/year} \times 14.1 \text{ lbs/ton}) + \dots} \times 100\% \\
 &= \frac{188,913 \text{ lbs/year}}{288,992.61 \text{ lbs/year}} \times 100\% = 65.4\%
 \end{aligned}$$

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This calculation is completed for each device type and for each county to create Table B-5 below.

Table B-5 Ratio of Contribution to County Wood Stove PM2.5 Inventory

County	Conventional	Phase II, Non-Catalytic	Phase II, Catalytic	Pellets	Compressed Wood Logs
Fresno	65.4%	22.1%	6.8%	5.7%	0.0%
Kern (SVJ)	70.5%	18.9%	3.3%	7.3%	0.0%
Kings	67.0%	19.4%	3.5%	10.1%	0.0%
Madera	49.4%	29.7%	15.7%	5.2%	0.0%
Merced	71.2%	19.9%	4.6%	4.3%	0.0%
San Joaquin	64.9%	20.2%	4.9%	10.1%	0.0%
Stanislaus	69.1%	19.2%	4.4%	7.2%	0.0%
Tulare	68.9%	20.9%	5.3%	4.9%	0.0%

e. Determine the portion of emissions from registerable and non-registerable wood stoves

The 5 categories in Table B-5 need to be combined into registerable and non-registerable categories, to account for the two-tiered curtailment requirement in the proposed rule.

For the purpose of this emission reductions analysis, the District conservatively assumes all wood burning heaters that qualify to register will do so. The device types that are registerable include EPA Phase II (Non-Catalytic), EPA Phase II (Catalytic), and pellet stoves. Conventional wood stoves and the compressed wood log category are non-registerable.

Calculating the percentage of the wood burning stove inventory for each county that is non-registerable is accomplished by summing the percentage contributions by county for each device type that is non-registerable. Similarly, the percentage of the wood stove emissions from registerable devices is calculated by summing the percentage from each registerable device type.

$$R_N = R_{\text{Conventional}} + R_{\text{Compressed Wood Logs}}$$

$$R_R = R_{\text{Phase II, Non-catalytic}} + R_{\text{Phase II, Catalytic}} + R_{\text{Pellet}}$$

Where:

R_N = Percentage of emissions from non-registerable wood stoves

R_R = Percentage of emissions from registerable wood stoves

$R_{\text{Device Type}}$ = Percentage of emissions from that device type

Example: Calculating the percentage of wood burning emissions due to registerable devices Fresno County.

$$R_R = 22.1\% + 6.8\% + 5.7\% = 34.6 \%$$

This calculation is completed for both non-registerable and registerable in each county to generate Table B-6 below.

Table B-6 Wood Stoves Contributions

County	Non-registerable	Registerable
Fresno	65.4%	34.6%
Kern (SJV)	70.5%	29.5%
Kings	67.0%	33.0%
Madera	49.4%	50.6%
Merced	71.2%	28.8%
San Joaquin	64.9%	35.1%
Stanislaus	69.1%	30.9%
Tulare	68.9%	31.1%

f. Determine daily average emissions from wood stoves during the wood burning season

To calculate the emissions for the wood stoves category for non-registerable and registerable devices, the emissions from

Table **B-2** is multiplied by the percentage contribution in Table B-6 for each county as shown below:

$$E_N = E_S \times \frac{R_N}{100}$$

$$E_R = E_S \times \frac{R_R}{100}$$

Where:

E_N = Daily average emissions from non – registerable wood stoves

E_R = Daily average emissions from registerable wood stoves

E_S = Daily average wood burning emissions for wood stoves

R_N = Percentage of emissions from non-registerable wood stoves

R_R = Percentage of emissions from registerable wood stoves

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Example: Calculating the PM 2.5 emissions inventory for wood stoves that are registerable in Fresno County.

$$E_R = 1.082 \text{ tpd} \times \frac{34.6}{100} = 0.375 \text{ tpd}$$

The results are shown below in Table B-7.

Table B-7 Emissions for Wood Stoves (tpd)

County	Non-registerable	Registerable
Fresno	0.707	0.375
Kern (SJV)	0.413	0.173
Kings	0.057	0.028
Madera	0.095	0.097
Merced	0.360	0.146
San Joaquin	0.391	0.212
Stanislaus	0.432	0.193
Tulare	0.373	0.168

g. Combine emissions from fireplaces and non-registerable wood stoves

Non-registerable devices include non-registerable wood stoves and fireplaces, and therefore fireplace emissions from

Table B-2 and non-registerable woodstove emissions from Table B-7 need to be combined as follows:

$$E_{N-Total} = E_N + E_F$$

Where:

$E_{N-Total}$ = Daily average emissions from non – registerable equipment

E_N = Daily average emissions from non – registerable wood stoves

E_F = Daily average wood burning emissions for fireplaces

Example: Fresno County total emissions from non-registerable residential wood burning

$$E_{N-Total} = 0.891 \text{ tpd} + 0.707 \text{ tpd} = 1.598 \text{ tpd}$$

This calculation is repeated for each county to generate the daily average emissions for all residential wood combustion during the wood burning season, as in Table B-8 below.

Table B-8 Daily Wood Burning Season Average Emissions from All Devices (tpd)

County	Non-registerable	Registerable
Fresno	1.598	0.375
Kern (SJV)	1.044	0.173
Kings	0.182	0.028
Madera	0.222	0.097
Merced	0.655	0.146
San Joaquin	1.265	0.212
Stanislaus	1.114	0.193
Tulare	0.765	0.169

STEP 2: DETERMINE EMISSION REDUCTIONS FROM ADDITIONAL DAYS OF CURTAILMENT

To calculate the emission reductions from lower curtailment thresholds, this analysis will determine the increase in number of Level One and Level Two curtailment days. The additional days for each curtailment level are multiplied by the appropriate daily emissions in Table B-8.

The analysis for step two is divided into the following:

- a. Determine the additional number of burn days for all wood burning fireplaces and heaters
- b. Determine the emission reductions due to additional curtailment days
- c. Convert total emissions reduced per wood burning season to annual daily average

The following provides the methodology, assumptions, and calculations for the emission reductions analysis for this step.

a. Determine the additional number of burn days for all wood burning fireplaces and heaters

Due to the proposed lower curtailment thresholds in the counties of Fresno, Kern, and Madera, there will be an increase in the number of curtailment days. For the remaining Valley counties, if the contingency is triggered in a specific county, that county would also be subject to the lower curtailment thresholds and result in an increase number of curtailment days in that county. Based on observed PM_{2.5} concentrations from the 2014-15, 2015-16, 2016-17, 2017-18, 2018-19 wood burning seasons, the average number of days in the current and proposed thresholds are summarized in Table B-9 and Table B-10, along with the additional curtailment days.

**Table B-9 Level One Curtailments in Hot Spot Counties
(Proposed and Current) Thresholds**

County	Proposed Threshold (≥ 12 and $< 35 \mu\text{g}/\text{m}^3$)	Current Threshold (≥ 20 and $< 65 \mu\text{g}/\text{m}^3$)	Additional Curtailement Days
Fresno	71	57	14
Kern (SJV)	61	54	7
*Kings	64	57	7
Madera	68	45	23
*Merced	64	38	26
*San Joaquin	66	45	21
*Stanislaus	67	53	14
*Tulare	67	52	15

**Additional curtailments will only occur if contingency is triggered per proposed Rule 4901*

Table B-10 Average Number of Days Above Level Two Curtailment Thresholds

County	Proposed Threshold ($> 35 \mu\text{g}/\text{m}^3$)	Current Threshold ($> 65 \mu\text{g}/\text{m}^3$)	Additional Curtailement Days
Fresno	20	3	17
Kern (SJV)	22	4	18
*Kings	25	6	19
Madera	12	1	11
*Merced	11	1	10
*San Joaquin	15	2	13
*Stanislaus	19	2	17
*Tulare	21	4	17

**Additional curtailments will only occur if contingency is triggered per the proposed Rule 4901*

b. Determine the emission reductions due to additional curtailment days

During a Level One curtailment, non-registerable devices are prohibited from being used. During Level Two curtailment, both non-registerable and registerable devices are prohibited from being used. The emission reductions is the sum of the additional Level One curtailment days from Table B-9 multiplied by the daily emissions for non-registerable devices from Table B-8, and the additional Level Two curtailment days from Table B-10 multiplied by the sum of the daily emissions from both non-registerable and registerable devices.

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$$ER_{Total} = N_1 \times E_{N-Total} + N_2 \times (E_{N-Total} + E_R)$$

Where:

ER_{Total} = Total emission reductions

$E_{N-Total}$ = Daily average emissions from non – registerable equipment

E_R = Daily average emissions from registerable wood stoves

N_1 = Additional level one episodic wood burning curtailment days

N_2 = Additional level two episodic wood burning curtailment days

Example: Fresno County emission reductions

$$ER = 14 \text{ days} \times 1.598 \text{ tpd} + 17 \text{ days} \times (1.598 \text{ tpd} + 0.375 \text{ tpd}) = 55.913 \text{ tons per year}$$

Table B-11 Emissions Reduced (tons per year)

County	Non-registerable	Registerable	Total County Emissions Reduced
Fresno	49.538	6.375	55.913
Kern (SJV)	26.100	3.114	29.214
*Kings	4.732	0.532	5.264
Madera	7.548	1.067	8.615
*Merced	23.580	1.46	25.040
*San Joaquin	43.010	2.756	45.766
*Stanislaus	34.534	3.281	37.815
*Tulare	24.480	2.873	27.353

*Emissions reductions will only occur if contingency is triggered per the proposed Rule 4901

c. Convert total emissions reduced per wood burning season to annual daily average

To be consistent with the daily average emission reduction commitment in the 2018 PM2.5 Plan, the wood burning season daily average is converted to the daily average by dividing the emissions reduced from Table B-11 by the number of days in a year.

$$ER_{Annual} = \frac{ER_{Total}}{N_A}$$

Where:

ER_{Annual} = Annual daily average emission reductions

ER_{Total} = Total emission reductions

N_A = Number of days per year

Example: Fresno County annual average emissions reduction

$$ER_{Annual} = \frac{55.913 \text{ tons}}{365 \text{ days}} = 0.153 \text{ tpd}$$

This calculation is repeated for each county to determine the annual daily average emissions reduced by county, as summarized in Table B-12 below.

Table B-12 Annual Daily Average Emissions Reduced by County

County	Emissions Reduced (tons per day)
Fresno	0.153
Kern (SJV)	0.080
Madera	0.024

STEP 3: DETERMINE THE TOTAL EMISSION REDUCTIONS FROM LOWER CURTAILMENT THRESHOLDS IN THE COUNTIES OF FRESNO, MADERA, AND KERN AND POTENTIAL EMISSION REDUCTIONS FROM THE CONTINGENCY PROVISION

In the 2018 PM_{2.5} Plan, the District committed to achieve additional PM_{2.5} emissions from lower curtailment thresholds in the counties of Fresno, Madera, and Kern. In addition, for the remaining counties, the District committed to impose the lower curtailment thresholds for a specific county if contingency is triggered for that county.

The total annual daily average emission reductions from the proposed curtailment threshold amendments in the counties of Fresno, Madera, and Kern is the sum of the emission reductions for these counties from Table B-12 above.

Total Emission Reductions = 0.153 + 0.080 + 0.024 = 0.257 tpd

The potential emissions reduction for each county, if contingency is triggered per proposed Rule 4901, is summarized below.

Table B-13 Potential Emission Reductions from Contingency (tpd)

County	Emissions Reduced
Kings	0.014
Merced	0.069
San Joaquin	0.125
Stanislaus	0.104
Tulare	0.075

APPENDIX C

Economic Analyses

June 20, 2019

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**ECONOMIC ANALYSIS
Amendments to Rule 4901**

Pursuant to California Health and Safety Code (CH&SC) requirements, the District has performed a cost effectiveness analysis and socioeconomic analysis to assess the economic impacts of amendments to Rule 4901 in the Valley.

The proposed Rule includes commitments for enhanced Valleywide measures and targeted measures focused in specific Hot Spot areas of the Valley (Madera, Fresno, and Kern counties) that will achieve further emission reductions where they are needed most to protect public health and help the Valley attain federally mandated air quality standards. The proposed Valleywide amendments to Rule 4901 include new requirements for significant remodels of a fireplace or chimney that require the removal of open hearth fireplaces or replacement to cleaner devices, only allowing seasoned wood to be burned, enhanced compliance during transfers of residential real property, further restrictions on installations of new wood burning devices, and enhanced visible emission limitations.

I. COST EFFECTIVENESS ANALYSIS

Per CH&SC Section (§) 40920.6(a), the District conducts absolute and incremental cost effectiveness analyses of available emission control options to evaluate the economic reasonableness of a rule or rule amendment prior to adoption. Absolute cost effectiveness of a control option is the additional annual compliance cost (in dollars per year) of the control technology or technique divided by the emission reduction achieved in tons of pollutant reduced per year (tons/year). Incremental cost effectiveness is the difference in cost between two successively more effective controls, divided by the additional emission reduction achieved.

The costs of the following proposed amendments are not anticipated to be significant.

- Prohibit installation of new wood-burning devices, except for the limited installation of EPA Certified wood burning heaters in areas with no natural gas service or at elevations 3,000 ft or above.
- Enhanced visible emissions limitations for wood burning fireplaces and nonregistered wood burning heaters
- Requirement for significant remodels of a fireplace or chimney that requires the removal of open-hearth fireplaces
- Only allow seasoned wood to be burned Valleywide
- Enhanced enforcement during the sale or transfer of residential real property by requiring statement of compliance forms for all residential real property in the Valley

For the proposed lower curtailment thresholds, which will result in additional days of no burning, the costs incurred by Valley residents would be the cost of turning on the home's heating system instead of burning an approved fuel such as seasoned wood or

pellets in the home's wood burning heater. Because the cost of the electricity is offset by the cost of the approved fuel, amendments to this rule are considered no cost amendments. The District is aware that some residents burn free wood; however, this is considered an anomaly due to its rarity and will therefore not be accounted for in this analysis.

II. SOCIOECONOMIC ANALYSIS

Pursuant to CH&SC §40728.5, the District conducted a socioeconomic analysis of the proposed rule amendments. This socioeconomic analysis, guided by the CH&SC, examines how rule amendments may impact the San Joaquin Valley's (Valley's) industries and businesses, employment rates, and economy.

A. Socioeconomic Analysis

The CH&SC consists of six specific requirements. The discussion of the necessity of amending Rule 4901 to attain federal ambient air quality standards is in the body of the staff report. The emission reductions potential of amendments to the rule are discussed in Appendix B (Emission Reduction Analysis). The other CH&SC requirements for a socioeconomic analysis are satisfied through this appendix.

Type of industries or businesses, including small businesses, affected by amendments to the rule

A socioeconomic impact is any effect to the Valley's employment or economy due to a regulatory action. The following groups that could potentially be affected by these rule amendments are manufacturers of the devices, retailers who sell the devices and associated fuels, retailers who sell the seasoned wood for fireplaces, and Valley residents who live in homes with fireplaces or wood burning heaters that do not qualify to be registered with the District.

There are no manufacturers of wood burning heaters in the Valley. Retailers who sell residential wood burning devices and associated fuels are in a position to increase profits due to the estimated increase in Valley residents who will upgrade their existing fireplaces and older more polluting devices for EPA certified devices. Retailers who sell the seasoned wood for fireplaces may potentially experience some decrease in profits due to the additional No Burn days. No significant socioeconomic impacts are expected to result from rule amendments.

Availability and cost effectiveness of alternatives to the rule amendments

There are no alternatives to lowering the episodic wood burning curtailment thresholds and the cost for the other proposed amendments are not significant; therefore, there would be no increased cost.

Impact of amendments on employment and the economy of the region

Because this is essentially a no cost rule and the socioeconomic impacts on Valley businesses and industries is not significant, no impact is anticipated on employment or the economy of the region.

B. Additional Socioeconomic Analyses

Per the *2011 Economic Analysis Process Recommendations* document, District staff is advised to include additional analyses as a part of each socioeconomic analysis for new or amended rules. As such, the District also evaluated the costs and socioeconomic impacts from previous versions of a rule and Impacts to small businesses, municipalities, and at-risk communities.

Costs and Socioeconomic Impacts from Previous Versions of the Rule

Rule 4901 was adopted on July 15, 1993 and subsequently amended in 2003, 2008, and again in September 2014. For purposes of this analysis, the District did a historical review which included the September 2014 amendments. The analyses for the 2014 amendments resulted in the conclusion that impacts stemming from the proposed amendments are less than significant across the board, particularly from the vantage point of the retailers that sell logs and small businesses are not disproportionately impacted by the rule.

Impacts to Small Businesses, Municipalities, and At-Risk Communities

As discussed in the analyses above, the impact to small businesses and at-risk communities is less than significant and municipalities would not be affected by rule amendments.